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EDITED BY  
F. J. CHITTENDEN, F.L.S.

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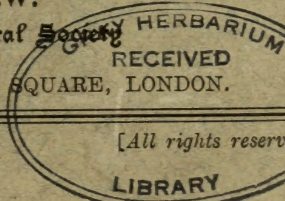
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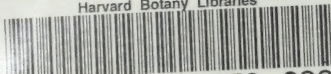
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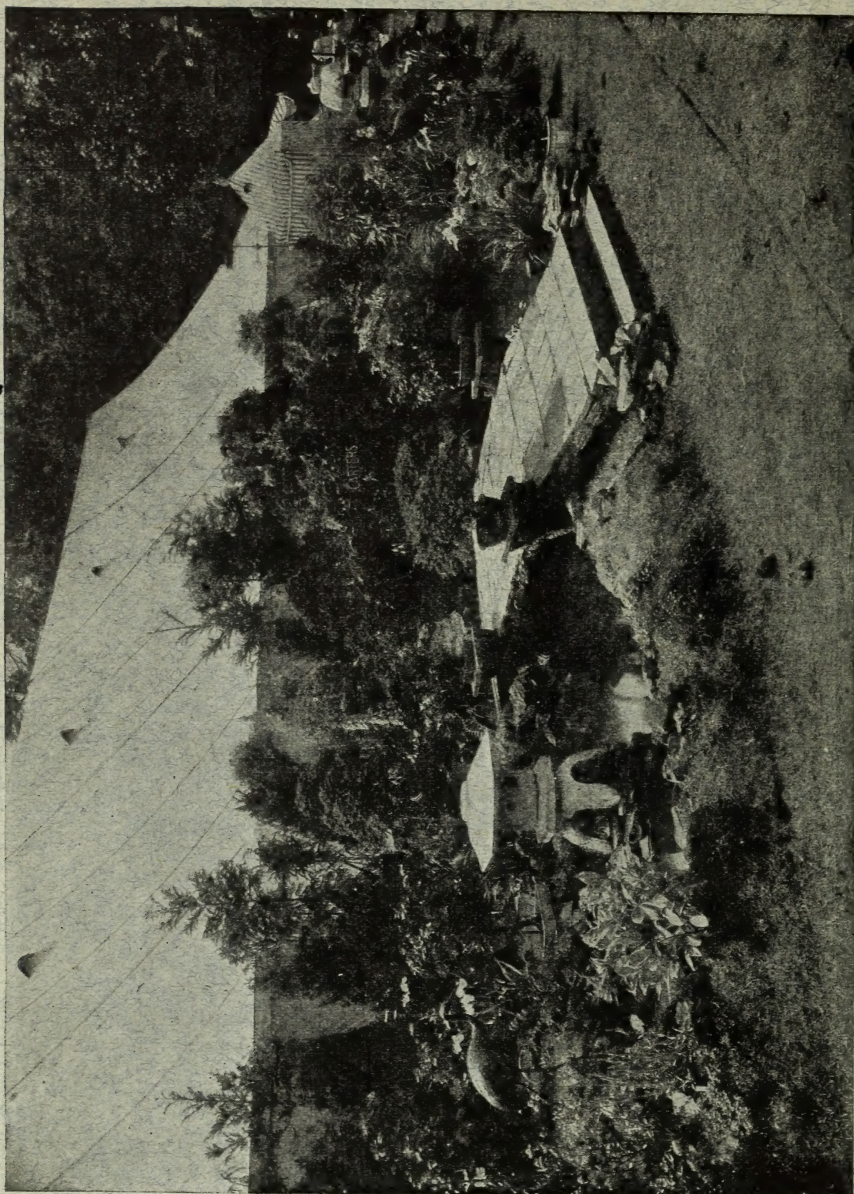






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# JOURNAL

OF THE

## ROYAL HORTICULTURAL SOCIETY.

VOL. XXXV. 1909.

PART I.

### THE CULTIVATION OF FRUIT IN BRITISH COLUMBIA.

By Mr. H. HINCKS, F.R.H.S.

DURING the last few years much attention has been attracted to British Columbia as a country to which to turn with a reasonable prospect of making a living, on account of its fruit-growing capabilities. In no small degree has its fruit attracted the attention of the many who have not an "opening" at home, but in no less a degree has it attracted the notice of the few who look for good fruit to eat and have a difficulty in getting it.

Many have seen the fruit at the Royal Horticultural Society's shows, but comparatively few have ever tasted it; and the taste of an apple, as in the very earliest days, is still a temptation, heightened when its equal does not often find its way into the shops of fruit-dealers.

British Columbia, not, I venture to think, without deserving it, is becoming a place to look to for fine fruit, and for a pleasant life in the growing of it—a life full of hard work certainly, but one in which, if not a fortune, at least a comparatively safe income may be earned; a life healthier than in an office and congenial to those who like to work with their hands.

It is often said that people should have gone there to grow fruit five or six years ago, but, from what I have seen, the object lessons which can be learned from looking at mistakes made in the varieties planted, and the way in which they were cultivated, almost entirely compensate for the time lost. The indifferent varieties planted in the early days of fruit-growing, will, as time goes on, have to give way to the fine varieties of the future. The poorer varieties are bought now only because no quantity of the finer ones can yet be obtained.

The following are points which are worthy of the attention of any one thinking of starting fruit-growing:—

1. See all the land you can before buying anything.
2. Be sure that it is fruit-growing land which you do buy.



3. Beware of land subject to floods—looking and enquiring for the highest point ever reached by river or lake.

4. In buying, keep the price low, and remember what the land will cost by the time it is cleaned and ploughed. The higher price is no criterion of quality, but rather of fashion in land, where living is more expensive.

5. See outlying districts, rather than buy land which has been picked over by many before you came.

6. Remember that land fit to plant must be such as may be ploughed in any direction. Do not plant in an excess of potash, and when planted keep your ranche properly cultivated.

7. Plant only the best varieties of apples.

Dry months occur all over British Columbia, and it will be found that July and August are times when a lack of moisture will check the growth of the trees in their early stages, and in some orchards bad results from insufficient moisture are even now apparent. To avoid this some system on the lines given below will have to be adopted :—

1. Irrigation.
2. Dry cultivation.
3. Relying on "seepage."

Irrigation is a troublesome system in an orchard, for while land is being irrigated it needs constant attention, and even then more or less bad "wash-outs" will take place.

In the opinion of many it detracts from the flavour of the fruit grown, and it stands to reason that by this system much plant food must be washed out of the ground. Irrigation must tend to bring the roots of the trees along the line followed by the water, rather than equally distributing them around the stem, and thus less plant food is available, by limiting the area from which the tree derives its nutriment.

Water in British Columbia always costs money in some way or other, and dependence on irrigation must be counted as an extra expense; it is either put on to the price of the land, when bought, or it is collected yearly as a rent, or you find your own water supply when you "stake" out your land and convey it to your orchard. It also costs money in the labour necessary while irrigation is being carried out.

Dry farming necessitates the constant stirring of the earth, and keeping the surface of the soil dustlike in fineness, and this condition can only be arrived at by constant cultivation, which therefore means constant labour. The summer heat tends, in a climate where dry farming obtains, to the premature ripening of the fruit, and greater risks have to be incurred when an orchard is first planted.

In these regions the hot summer climate is as a rule followed by a severe winter, and so there is a limitation of the varieties which can be successfully grown, and this means the elimination of the finest varieties of dessert fruit.

Natural moisture, or "seepage," can only be found in sufficient quantity to be serviceable at the foot of very high hills, thus limiting the area of cultivation and affording only small fruit-land areas near rivers and lakes.



But this is surely the most natural way to grow fruit, as here there is no washing of soil, no loss of plant food, no extra labour. Its only drawback is the comparatively small area on which sufficient seepage can be found—namely, where the immediately surrounding hills are high enough to feed the lower lands with moisture from melting snow, and where the land is not too rocky, or liable to flood, to make fruit-growing practicable.

Reviewing the districts, each one has its peculiarities, from drought on some of the western islands to the damp and lichens of the coast, through the hot reaches round Penticton and Keremos, through the erstwhile land of scrub round Okanagan Lake, to the timbered lands of West Kootenay, and on to East Kootenay's parched valleys. Some parts are well settled and others contain only isolated ranches. In the more settled places land has risen in value until it is almost beyond the reach of the average settler, whereas in the more easterly parts it can be bought for a quarter the price—land standing in timber, it is true, but land which has supported fine forest trees, and which will support fine fruit trees if the climate is not too severe. The chosen site of nature's forest is better suited to the growth of fruit trees than land unable at one time to support more than sage-bush and greasewood, forced out of a dryness too great for timber into an orchard grown by artificial irrigation.

Heavy clearing characterizes the land near the coast, light clearing in and about the Okanagan and Kettle River Districts, and medium clearing in the Kootenays. The cost of clearing an acre of land ready for the plough ranges from 50 dollars to 500 dollars, according to the district.

In travelling about British Columbia I was struck by the fact that in most cases ten acres (a one man's orchard) was all the land a man had. His future firewood was not considered. During the first years, tons of wood in timbered districts were burned to get at the soil, and I feel sure that a few years hence the complaint of the lack of cheap fuel will be great. The man is wise who in starting on timbered lands saves all the wood he can for fuel, and I would go still further and say that he should, if possible, acquire cheap adjoining land unsuited for fruit from which he can get his future fuel. I would also advise him to go to the lesser known parts to start his orchard, for if good land is chosen, with means of transport for fruit, there is no fear but that in due time neighbours will come. I have in mind parts of the West Kootenay District where good land may be bought at a reasonable figure, and a steep piece of hill-side bought to yield fuel. In the process of clearing timbered lands and burning large quantities of wood to get at the soil an excess of potash is formed, and clover crops grown and ploughed in are a necessity to bring back the nitrogen. In many cases the dense timber has excluded the sun for generations, and time which is given for the sun to sweeten the soil after clearing on these lands is time not wasted, but well spent. Often the neglect of such things as clover and sunshine results in disappointment in the early stages of an orchard.

Again, the stumps of trees are too often left in the ground in the race to get a piece of land planted, and these are always in the way, difficult to pull out and impossible to blow out after an orchard has been planted,



except by sacrificing the fruit trees, and if left in the ground they interfere with the yearly cultivation of the ranche.

So far the idea—one might almost say the rule—has been to plant many varieties and a few of each. But, looking at the business-side of it, shipments must, if they are to be made successful, be made by carloads, not by boxes, and in choosing varieties plant, say, three or four varieties for selling on ten acres, so that their picking will not come at the same time, and so that you may sell quantities of the same fruit off your own orchard rather than be compelled to hunt for somebody with the same variety (whose apples may be better or worse than your own) in order to make up a consignment.

In the choice of varieties of course the best dessert is the highest priced apple, but some of the best varieties are shy bearers, or poor pollen-producers, and remember in making your selection that most of the Government's excellent pamphlets are taken from experiments carried out in other provinces, or in the States, and in neither case is the climate the same nor are the soil and conditions similar to those which are found in British Columbia. For in a large province like this the different districts themselves vary enormously in these respects.

Peaches, strawberries, apples, and a variety of other fruits are grown in British Columbia, but it depends entirely on transport, markets, and the locality as to which will be the best business proposition.

In very few cases can one rely on the nearest town for the sale of all the fruit grown around it; but the Prairie on the east and Australia on the west are places where fruit is wanted and where it will sell.

Each year more settlers come out to Canada, and a large proportion of these go to places where fruit cannot be grown, increasing the numbers of miners, farmers, &c., who have to buy their fruit. At present we read that not half of the fruit consumed is raised in the province, yet some of this fruit, such as oranges and lemons, must be imported, and although there seems every probability that the demand, which is at present good, will continue for fruits which will travel long distances, yet local markets only can be relied upon for the "soft" fruits, and such demands are not large.

I would say in conclusion that there are many things which if run in conjunction with an orchard will help to tide over the five years of waiting until the bearing stage is reached, without growing such fruits as strawberries. Honey, eggs, and milk are all profitable, and, given energy and good business instincts, British Columbia has openings for many. Perhaps the most difficult decision which you are asked to make is in the selection of the land on which to make not only an orchard but with it your home.



## FRENCH GARDENING.

By Mr. C. D. MACKAY, F.R.H.S.

[Lecture delivered January 5, 1909.]

FOR many years I have advocated the growing of early salads in the way used by the French gardener or *maraicher*, but until recently only one or two such gardens had been started. Within the past year intensive cultivation has excited an enormous amount of interest among the leisured classes and among those who have gardens and gardeners of their own, and to these I more particularly wish to speak. Now that they have been awakened to the simplicity of growing early salads in their own gardens, they wonder why they have not attempted to supply themselves instead of being dependent on the foreigner as in the past. They had seen the gardens round Paris and marvelled at them, but they were under the impression that in our climate such methods as are there employed were doomed to failure, whereas there is virtually but very little difference, in fact only about two degrees in temperature, between Paris and London, and although they do not have the black fogs we do, they certainly have damp white ones.

The cry in the past has always been that our climate is not the slightest good for growing vegetables in the manner adopted in France, and that in France they have no frost, fog or snow, and no other difficulty to contend with, in rearing the plants. Of course this is not the case. The French gardeners who have had experience in this country say that the climate here is good, and that the lettuces did not "fog off" as they do in Paris.

Perhaps gardeners in this country have also been to blame, in that they have religiously adhered to their old-fashioned ideas. They knew only by hearsay of the wonderful way in which the French grew their early salads, and although their employers may have seen the methods employed and the results obtained, yet the gardeners had no opportunity, and possibly no desire, to see for themselves, and they foolishly condemned a system which they did not understand.

One essential must always be borne in mind: when gardeners attempt the system they must have the right varieties of seeds to grow, and it must not be thought that our usual varieties of lettuces, carrots, &c., are just as good as the proper varieties.

Ours really is a most favoured country, especially in the South and West, for this kind of intensive cultivation, and there should be no necessity for the huge quantities of lettuces, carrots, radishes, &c., to come from any foreign country as they do now. Actually lettuces are *now* (January) coming in from Paris and are realizing good prices, and why? Simply because our growers are so lethargic and non-progressive that they will not believe it possible to work the system successfully here; neither is it, unless they adopt the same methods as the French people;



these methods I will endeavour to explain a little later on. One thing, however, I am grieved about, viz., that a few people, who would practically not make a success of anything, have been lured by the golden prospects held out to them in certain sections of the Press, into embarking in an attempt to secure, from an outlay of £100 to £200, the comparatively enormous income of £400 or £500 a year. This, too, simply because they may have read a newspaper article, or my book on French gardening. For instance, I have been in communication with engineers, clergymen, and many other professional men who have had long years of training for their particular professions and who cannot make a successful living, but they think that with possibly £200, the amount mentioned in my book as possible, they are immediately going to make a good living without having the slightest idea of the method of work. I asked an eminent surgeon the other day if he thought that by reading a book upon surgery I should be able to operate successfully on any one. He said he would not care about my doing so on him at any rate, and I retorted that neither could a man by simply reading a book become a skilled gardener.

I am also sorry to see that the public are being asked to subscribe to large ventures of this description. Personally I do not think that French gardening on a large scale is to be advocated. The methods are suited to small gardens of one to two acres only, and such gardens require the unremitting and assiduous care of the proprietor himself. The name which has been coined for the system, "intensive," is a very apt one, for it is not, and can never be, an extensive one.

About fifteen years ago it occurred to me that there was no reason why we could not grow lettuces here, just as they did in France, and in conversation with an eminent French seedsman I learnt that it was the variety of lettuce which enabled the French to achieve such seeming wonders. I promptly got some of the seed, giving it to some of my English friends, but it was a failure. Going somewhat further into the subject I found that the seed was *not* everything, but that the way the plants were cultivated was also an important factor, and the cultivation is somewhat as follows. The French *maraicher*, and now the English gardener, begins to collect his manure from July onwards, storing it in great heaps. This he keeps until he requires it in December and during that month he collects an equal quantity of fresh manure.

This is then mixed in equal quantities and spread nine inches deep on the ground, and on the top of this the frames are placed. About six inches of soil is added to the top of the manure, and on this are sown radishes and carrots in January. Lettuces are planted in the frames at the beginning of January, and are cut towards the end of February. Lettuces are not required in this country very early.

The particular cabbage lettuce grown is one that has never been used in this country, except in the few French gardens now existing. It is quite distinct from any lettuce which we are in the habit of growing. If this lettuce is planted in the spring time, it will immediately run to seed, but if sown in October under cloches, the plants soon come up, and after a few days they are pricked out, twenty-five under a cloche, and left until they are wanted to finally replant in the beds in January.



It is astonishing that there are 2,160,000 cloches used in the immediate neighbourhood of Paris, and that there are also 1,000,000 lights devoted to the same purpose. The vegetable produce from these lights fetches the enormous sum of £500,000.

The straw mats which are used for this kind of gardening, or any other if necessary, do not absorb the wet like an ordinary Archangel mat, but allow the water to run off, and they quickly dry and are easily rolled up.

Cos lettuce, which is, if anything, more easily grown than the cabbage variety, is a splendid crop for paying when got into the market before our English outdoor ones are ready. They have to be raised at the same time as the cabbage lettuce, and pricked out in cloches, 25 to the cloche, but instead of being put under lights as the cabbage lettuce is, they must be planted out in small beds under cloches. Under each cloche one cos and three cabbage lettuce are planted, and over the whole of the ground carrots, such as have been sown in the frames, are sown.

On the outside of the cloches small-sized plants of another variety of cos lettuce, grown especially for the purpose, are planted to be coming on, and as soon as those under the cloches are cut, those outside are ready to have the cloches moved on to them to get a second crop.

Of course it would be absurd for everyone to start a French garden, either small or large, but it will be a long time before enough gardens are in working order to supply our wants. I most strongly urge those who wish to go in for French gardening to have a French expert. It is the cheapest in the end, as he can make his wages with extra crops at times when an English gardener would not dream of trying to get them.

I am no advocate of market gardeners rushing to invest large sums of money before they have gained the requisite knowledge, but they can start in a small way, and whatever money they expend will not be lost, as both the cloches and the frames are admirably adapted for other methods of cultivation, and I had this class of men in view when I mentioned an outlay of £200 as being all that was required for starting a French garden.

It is a pity that those interested in this or any other particular kind of gardening do not go and see the methods of our French, Dutch and German friends for themselves. None is so perfect that he cannot learn something, and if we go with unprejudiced minds we shall pick up ideas which may lead to the improvement of their own system.

Now the Dutch are if anything slower than we are in taking up new ideas, but they have started growing early vegetables and salads round the Hague, and they do it extremely well.

In our own country we have an enormous population, and a population who can afford to go to Paris for these delicious early vegetables. It is only necessary to educate people up to the fact that they can obtain them in England, and, moreover, that they can have them fresh either at lunch or dinner cut the same morning, instead of being sweated in boxes coming from France, taking three or four days over the journey, then possibly lying in a shop window for two more days until sold.

In advocating the growing of early vegetables in England please do



not misunderstand me. This is no golden road to riches. In growing these vegetables, hard work year by year is the only means of gaining success. It is true we may "French garden" here, but it is also true that it entails very hard work.

"Golden soil" is very alluring, and the gross profits of a concern run on the lines indicated merits the name, but only the indefatigable toil of a French *maraicher* devoted to it will make it a success.

It may interest you to know how many of these lettuces, &c., are sent every day from February to April to London. The usual consignment every day is four to five thousand crates of lettuces, 500 crates of small early carrots, 100 crates of asparagus, 100 crates of long French turnips, and 50 crates of *celeriac*.

Do not these figures give you some idea of the importance of this method of gardening?

People say that this gardening will soon be overdone. I do not think this will be the case. At the present time the prices of lettuces and carrots in the very early spring are prohibitive to all but those who are fairly well off; but if by production one can cheapen them so that they come within the reach of everybody, the present quantity of 5,000 crates of lettuces a day will speedily jump to 20,000.

These particular lettuces are sold by the French gardener to a middleman at 6*d.* a dozen all through the season, the growers themselves do not ship anything to England. If the French gardener gets 6*d.* a dozen he is quite happy, and it pays him well, and I have seen no French gardens which do not look as prosperous as they can possibly can be.

As you all know, here there will be no difficulty in getting 1*s.* to 1*s.* 6*d.* a dozen, even if they are what you consider to be low in price.

Many will remember the time when tomatos were grown only to a very small extent, when they fetched a high price. When the Canary Islands and other early places began to send in their tomatos, it was thought that it would kill the English trade altogether, but has it? I should say that at the present day there are two to three cwt. of tomatos grown where one pound used to be grown years ago. They are one of the most paying crops, no matter whether grown inside or out of doors.

When Guernsey began growing tomatos, did they suppose for one moment that thousands of baskets would be sent away every week? Why should not this success be reflected in a partial way for these lettuces and other produce?

I advocate growing strawberries under glass, not in green houses in the ordinary way, but in frames such as are used for this particular style of gardening.

As you know, strawberries when they first come in from the open ground are sold for anything from 9*d.* to 1*s.* 6*d.* per lb., and if they had been brought on earlier by being covered with lights they would have sold for double that price, and at this price they are a very paying crop indeed.



## THE EFFECTS OF GROWTH AS SEEN IN CERTAIN MOVEMENTS OF PLANT-ORGANS.

By REV. PROFESSOR G. HENSLOW, M.A., V.M.H., &c.

[Lecture delivered April 6, 1909.]

INTRODUCTION.—One of the most prominent effects of growth is the resulting movements of plant-organs. Though the most obvious characteristic of plants in general is that they are fixtures in the soil; yet, probably all the higher plants, at least, have their growing parts more or less in motion for a time. In some cases of microscopic aquatic organisms, the whole being is in motion in the water, as, *e.g.*, diatoms, Oscillatorias, and the zoospores of Algæ. It is not known for certain how the first two\* effect their movements, but they are in some way dependent on the properties of protoplasm; the third are provided with protoplasmic cilia, and these are obviously the instruments of motion.

There are also numerous movements of protoplasm within cells, especially when the process of cell-division takes place. The well known "streaming" and "rotation" are continually going on and well seen in *Chara*; but these will not concern us now.

Other movements of organs are also the result of forces *within* the cells, and not the direct consequence of external agencies; some of these will be referred to; but it is especially the movements resulting from stimuli of the surrounding physical conditions of life which I propose to deal with.

As soon as plants begin to grow, their organs are subjected to, and respond to, various external stimuli; and the problem is to detect which is, or are—as there may be more than one—acting upon any organ at any one time. The chief influences are (1) light and (2) shade; *i.e.*, really, varying degrees of light till perfect darkness may occur. (3) Varying degrees of heat and cold. (4) Moisture in the air or soil. (5) Gravitation, always acting in a direction perpendicular to the earth's surface. (6) Contact with a resisting surface. (7) To the preceding may be added the internal influence of cellular growth, which produces external movements of growing shoots.

Organs may be developed under these influences without movement; but if their positions be altered, they will move or turn towards the source of the influence.

Both the *tendency* to respond to any of these influences may become a fixed and hereditary character, and take place when the original exciting influence is absent; and the *structure* itself caused by response may be, and usually is, hereditary as well; so that it may be formed completely or partially *previous* to the commencement of the action of the stimulus which had originally given rise to it.

\* See *Cryptogamic Botany*, by Bennett and Murray, pp. 422 and 442.



The terms I propose using to express the "turning" towards the stimulus are as follows: (1) Phototropism (to diffused light), and Heliotropism (to the sun); (2) Skototropism (to shade or darkness); (3) Thermotropism (to heat); (4) Hydrotropism (to moisture); (5) Helkotropism (to attraction of Gravitation); (6) Haptotropism (to touch); (7) Orthotropism (becoming erect or pendulous); (8) Circumnutation (bowing around).

I avoid the usual term Geotropism, used for the influence of Gravitation, because a "turning earthwards" may be due to shade as well; while Apogeotropism, I would regard as a synonym for *one* application of Orthotropism; for organs can place themselves in a vertical position from more than one cause.

#### PHOTOTROPISM, HELIOTROPISM AND SKOTOTROPISM, OR THE EFFECTS OF LIGHT AND SHADE.

In flowering plants, as soon as a seed begins to germinate, the root-end (radicle) and shoot-end (plumule) of the embryo first begin to grow in opposite directions, under the influence of external stimuli. The first question is, Why do they grow orthotropically, *i.e.* in a vertically straight line, and why does the former bend downwards and the latter upwards, if the growing seedling be placed horizontally? As gravitation is a constant force acting vertically downwards, we might naturally infer that this was the cause acting on the root, and so the "turning downwards," under the influence of gravitation was called "Geotropism" and the turning upwards of the shoot was named "Apogeotropism." These words are descriptive only, not explanatory.

If we turn to the simplest or unicellular organisms, such as the spherical spores of Cryptogams, which have no polarity or any distinction of parts, we find that the two most important stimuli are light and shade. Thus the first cell-division, as in the spores of *Fucus*, *Equisetum*\* and *Ascomphyllum*,† is approximately at right angles to the incident light, the daughter-cell facing the less illuminated half develops into the root, while the other becomes the shoot-end. Sachs describes and figures the shoot and gemmule of *Marchantia*, and the structures are reversed when the usual dorsi-ventral arrangement has been made to be ventri-dorsal.‡ Similar effects are produced on the prothallia of ferns; so that the position of the sexual arrangements are always on the *shaded* side. If the prothallium be grown immersed in water it curves itself so as to be at right angles to the light and then produces those organs on the shady side.

Chlorophyll granules illustrate both phototropism and skototropism very well; for in diffused light they spread themselves over the superficial cell in such simple plants as duckweed; such would be phototropism; but if the direct light of the sun be very intense they place themselves over the vertical walls to avoid it. This movement is therefore skototropism or apheliotropism, whichever term be preferred.

In the case of germinating embryos of plants which do not grow on the ground, as the mistletoe and epiphytes, the roots adhere to the bark of

\* See *Origin of Plant Structures*, p. 197, note.

† Res. *Gen. de Bot.*, I., p. 58, fig. 5.

‡ Sachs' *Phys. of Plants*, p. 524-6.



trees and do not grow downwards, but turn towards the darker side. In the mistletoe the hypocotyledonary axis terminates in a pestle-like expansion in adaptation to the bough to which the seed adheres by mucilage. This peculiar organ is prepared by heredity in advance, in readiness for adhesion, just like the pads of *Ampelopsis Veitchii*.

In epiphytes, as orchids and aroids, some roots cling to the stems horizontally, while others descend freely and vertically to the ground; so that while shade determines the former to grow towards, and haptotropism,\* to cling to the stem as they elongate, gravitation affects the latter.

The climbing roots of ivy also emerge from the less illuminated side of the stem. This latter, too, is acted upon by shade, for when the stem reaches the top of a wall the terminal shoot bends downwards in order to grow flat upon it. As it is quite immaterial whether the ivy be growing on the north or south side of the wall, the movement can only be due to a preference for less illumination. Of course this is now a hereditary adaptation to the production of climbing roots. Similarly do the shoots of *Ampelopsis* turn to the shady side, as they require their adhesive pads to adhere to the wall.

Ordinary leaves place themselves at right angles to incident light. This might be called diaphototropism.† The consequence is that they are dorsi-ventral in structure; but some have acquired the now hereditary habit of reversing the sides, as *Alstroemeria*. The internal structure is correspondingly reversed. It is produced by a twisting of the short petiole, possibly to acquire strength, just as the ovary of *Orchis*, which has no central placenta, acts as a strengthening pillar.

If a naturally growing blade be partially fixed in a reversed position when growing it makes a most determined effort to right itself.

Now the orthotropic growth of ordinary stems and the axial roots of germinating seedlings, was presumedly and *primarily* (like spores) due to phototropism and skototropism respectively.

This is well seen in growing seeds, as of mustard, suspended in water, and covered above by a screen, but exposed to bright illumination from below only. In this case the hypocotyls all turn downwards.

HEREDITARY INFLUENCES.—Besides the influence of shade, as the root grows downwards gravitation acts upon it and its effects have become fixed and hereditary. Similarly growth in opposition to it, primarily due to phototropism, has become fixed; so that shoots fresh cut and laid in total darkness will turn up their tips.

That one of the elements of geotropism, *i.e.* "turning earthwards" is skototropism is seen in young roots, say of mustard when grown in water, which offers no resistance. If the glass vessel be surrounded with black paper, one strip only being left uncovered for the entrance of light, all the roots bend to the opposite side. Roots of cabbage grow downwards though illuminated only from below.

Mr. W. G. Smith described, some years ago, how the stolons of *Saxifraga sarmentosa* in a pot by a window grew inwards, but as they produced new rosettes, they turned towards the window, *their* stolons growing inwards till they produced secondary rosettes and so on. He

\* A term proposed by Prof. Leo Errera, for action of tendrils, etc.

† Dia-, in the sense of "across."

notes that other stolons on the ground, as strawberry runners, have a strong tendency to "congregate in more than usually shaded places."\* Now it must be emphasized that many habits of plants due to growth originally caused by responses to external stimuli may become so permanently fixed in the life of the species that they occur when the original stimulus is not present.

This permanency of acquired habits is thus well described by Professor Vines. In speaking of the periodicity in the circulation of water in plants, he says: "It has doubtless been induced in plants by the daily variations of external conditions, perhaps more especially of illumination, which are involved in the alternation of day and night; but it has become so much a part of the nature of plants, that it is exhibited, even when the conditions which originally induced it are not present, and it is transmitted from generation to generation."† Darwin corroborates such tendencies to become hereditary.‡

There is reason to think that an acquisition of *any* special habit may become fixed and hereditary. Perhaps one of the most conspicuous is the orthotropism of the terminal part of a stem in total darkness when it has been placed horizontal, already referred to.

It is customary to attribute this orthotropism to gravitation; but we must remember that erect stems grow in *direct opposition* to it; and, to do this, the stem develops varying amounts of mechanical tissues, always somewhat in excess, to resist the ever existing downward "pull" of gravitation, and other strains due to wind, &c.

A remarkable instance of change of direction is seen when the tap-root or the terminal shoot of the stem is removed. In the former case, the secondary previously horizontal roots grow downwards, and the boughs near the top grow upwards. These changes must be partially at least attributable to some sudden impulse due to the checks given to the flow of sap in both cases, coupled with gravitation and light.

A permanent result of the former is seen in all Monocotyledons and aquatic Dicotyledons, as in neither is the tap-root preserved, but numerous adventitious roots arise from the stem and grow downwards, supporting it as well as absorbing nourishment. Analogous instances may be seen in the two varieties of trees called "fastigate" and "weeping." In the former *all* the branches grow orthotropically, and in the latter in a pendulous manner. How these habits arise is not known. It appears they may (as in Irish yew), or more probably may not, be hereditary, as in the ash. Seedlings sometimes show at first a slight tendency "to weep," but subsequently lose it.

Sachs gives an excellent illustration to show these inherited tendencies to orthotropism. A *Yucca gloriosa* growing in a pot, with its vertical rhizome, is inverted. In this condition buds on the rhizome, as well as roots are developed from it, the former grow vertically upwards and the latter downwards, though both are, of course, in total darkness, as they are buried in the soil. §

\* *Gardeners' Chronicle*.

† *Physiology of Plants*, p. 96.

‡ *Movements of Plants*, pp. 407, 491.

§ *Sachs' Physiology of Plants*, p. 529, fig. 344.



In the preceding few cases, the organs *grow* in accordance with the external stimuli; but if the relative positions of plants with respect to light, gravitation, &c., be altered, then the organ moves or bends out of its original direction to try to put itself in harmony with it.

These external stimuli, therefore, *first*, induce growth, and *then*, when the direction is changed, the plant-organs respond and move themselves so as to be in adaptation with it. Thus, if cabbage or other seed be grown in a pot, upon which the light falls from one side, the seedlings, as they come up, at once *grow* towards it. If the pot be reversed in position, the hypocotyls begin to bend, about one-third of their length from the cotyledons, the curvature extending downwards till the middle of the concave side is about half-way. There is no circumnutation, but a bending solely in a vertical plane. This phototropism may be repeated again and again if the pot be repeatedly turned half-round.

How are we to account for the fixed and hereditary habit of ivy and *Ampelopsis* turning their shoots in the direction of the less illuminated side?

Comparing the climbing position of the stem with the upper free-growing flowering branches of ivy, the latter have just the reverse habit, for they grow outwards, away from the trunk and branches of the tree to which the lower part of the stem clings. Similarly in the Virginia creeper, the tendrils were originally adapted to grasping twigs and climbing by that means, as do vines, to which the *Ampelopsis* is closely allied.

There seems to be but one answer, viz., it is an acquired and now hereditary habit. A species of *Trichosanthes* of the cucumber family, cultivated in a frame, accidentally found its tendrils pressing against the brick wall. Contrary to its normal habit, it at once began to make adhesive pads; and so we may imagine that the ancestor of the Virginia creeper first acquired this habit in a similar way, the tendrils being now fixed to the wall by adhesive pads; so that its illumination is one-sided. This unequal illumination we must assume caused a response to arise which now induces the shoots to grow or turn towards the darker side.

Of course, the origin of all epiphytal plants which cling to the boughs or trunks of trees by means of aerial roots will receive the same interpretation. Thus a tropical epiphytal orchid begins by the seeds being blown up to and resting on the boughs. It could not long remain there *unless its roots could cling to the bough*. We must assume, therefore, that they turned towards the bough, as the radicle of the mistletoe does, that is the less illuminated side, and adhered by clasping and cementing epidermal cells.

#### HYDROTROPISM and HELKOTROPISM.\*

Both moisture and gravitation play a great part in determining the direction of root growth. The latter is a feeble force and easily counteracted by the former, as Sachs has so well shown †; but when roots are permeating a uniformly moist soil, as they arise endogenously at right

\* I suggest this word, as Geotropism may be partly due to darkness and moisture besides gravitation. The Greek verb *helko*, to "attract," is used of the magnet, as well as of the "drawing" down of a balance by weight, i.e., gravitation.

† *Phys.*, p. 715, fig. 404.

angles to the parent root, they simply continue to elongate more or less in the same direction. If, however, they be in a comparatively drier place and a moister one be at some distance, they will *grow* in the direction of the latter quite irrespective of gravitation. So that Hydrotropism easily overcomes Helkotropism.

A good illustration of what may be most probably due to gravitation *alone* is seen in the descending aerial roots of the Indian fig or banyan; inasmuch as the dense shade would be *above* and light *below*; so that as the roots pass through the air this would be throughout equally dry or moist as the case may be, leaving gravitation alone to exert its influence.

#### THERMOTROPISM.

Another stimulus of attraction causing movements, is heat. When one side of a plant receives a higher degree of temperature than the other, stems and leaves will often turn to the warmer side. Kerner observes that in the high Alps, the air being rarefied, the exposed ground receives great heat from the sun; but the temperature of the air above it may be lower; so that many plants creep along the ground, such as species of willow, "*Juniperus pyramidata* var. *humilis*, called the 'creeping Sabina.' *J. nana* or *alpina*, i.e. a dwarf form of *J. communis*, sends out from the collar of the root long branches trailing on the ground, as is generally the case with Alpine plants."\*

Kerner gives the excess of the mean temperature of the soil over that of the air of different altitudes on the Central Tyrolese Alps as follows: at 1,000 m., 1.5°C.; at 1,300 m., 1.7°C.; at 1,600 m., 2.4°C.; at 1,900 m., 3.0°C.; and at 2,200 m., 3.6°C.

In warmer climates similar phenomena are to be seen. I frequently noticed in Malta that very many plants are prostrate when growing by road sides, where the limestone rock is often exposed and gets heated. The Maltese 'clover,' *Hedysarum coronaria*, grows to a height of 3 feet in the fields, but stray plants are perfectly prostrate by the roads. The same thing occurs with both *Malva sylvestris* and *M. parviflora*.

Similarly with leaves, a small species of dandelion often grows between the loose stones of walls in Malta. When extracted, the leaves, which were flat against the hot vertical wall, curled back against the root, and refused to be straightened out when required to be dried.

In early spring in England, bluebells may be seen having their first formed leaves lying flat on the ground, and daisies and plantains always have them so in a close-cut lawn.

The following observations on temperatures will perhaps show how thermotropism may account for the prostrate position independently or conjointly with light, a feature of common occurrence in this country.

The temperature at the surface of the damp soil by the side of a bluebell growing in the shade of trees, at 9.45 A.M., April 15, 1891, a sunless morning, was 47° F. The temperature of the air three inches above the ground at the same time and place was 41.5°. At 4 P.M. of the same day, on the surface of the soil the temperature was 60°; while that of the air

\* See *Origin of Plant Structures*, pp. 101, 102.



was 52°. Similar differences, only varying slightly, occurred on a mown lawn.

These observations appear to suggest the cause of the long creeping stems in sand by the sea as of *Carex arenaria*, *Agropyrum* (*Triticum*) *junceum*, &c., in that the hot, upper layer of the sand may be the stimulus to develop shoots which then grow horizontally below the surface; this suggestion is supported by the fact (recorded by Babington) that *Hordeum murinum* var. *arenaria*, Bab., has "the lower part of the stem buried, lengthened and rooting, thus appearing to creep in the sand of the sea-shore."

Experiments have shown that the shoots of cress seedlings curved away from the source of heat whereas maize seedlings curved towards it. The roots of hyacinths are thermotropic, but the leaves apothermotropic (Vines). I found seedlings of wild cabbage were indifferent to heat, when the pot containing them was in total darkness, the temperature by the side next a fire being 100° F., and the opposite side, 80°. The pot was 3 inches in diameter.

#### HAPTOTROPISM AND APHAPTOTROPISM.

So many cases of organs bending after being touched are described by Darwin in his works on *The Movements of Plants* and *Insectivorous Plants*, &c., that the reader is referred to them. With regard to root-tips, "Sachs discovered that the radicle a little above the apex is sensitive and bends like a tendril *towards* the touching object. But, when one side of the apex is pressed by any object, the growing part bends *away* from the object. . . . We are therefore led to suspect that the *apex* was sensitive to contact . . . Some few stems bend towards a touching object, but no case, we believe, is known of an organ bending away from one."\* The advantage of this power to a root penetrating the soil is obvious.

#### ORTHOTROPISM.

Besides phototropism, another kind of orthotropic motion is produced by growth in the development of leaf-buds. If the opening bud of lime or beech be observed in spring, the young leaves, as they appear, curve downwards, and as they gradually enlarge and become full-grown, rise up again and assume the horizontal position. In the walnut the petiole of the pinnate leaf curves strongly downwards, and only rises when the leaflets are fully developed. In the ash the petiole curls upwards. In every case they are in a vertical line, hence I call it orthotropism.†

The "object" of these movements is to place the delicate immature blades in an erect or vertical position so as to avoid the chill produced by radiation, which is always greater from a horizontal surface. Leaves perform very similar movements in the tropics, but in this case it is to protect them from desiccation under the powerful heat of the sun. The movement, therefore, is apheliotropism.

\* *Movements of Plants*, pp. 131, 132.

† "Vernation and the Methods of Development of Foliage, as Protective against Radiation."—*Jour. Lin. Soc.*, vol. xxi. p. 624.

In intensely cold winters the leaves of evergreens, such as holly, may be seen to hang vertically downwards as long as the cold lasts.

An analogous orthotropism is seen in the sleep or hypnotic condition of plants fully described by Darwin, in his *Movements of Plants*.

#### CIRCUMNUTATION.

As soon as the root and stem have grown long enough, having been vertical at first, they both begin to move approximately in circles or ellipses. This is presumably due to the apical growth of the stem not being strictly simultaneous at all points of the circumference. If the tip of the stem of some cryptogams—say, *Equisetum*\*—which is simpler than that of an Angiosperm, be examined, it will be found to possess a conspicuous terminal cell. From this, new cells are cut off in a spiral order, the centre of each cell being at  $120^\circ$  from the preceding, as measured on radii from the centre of the apical cell.

Though it has not been clearly demonstrated that the apices of Angiospermous stems start with a single cell, as this apex is so soon composed of a mass of merismatic tissue, still, judging by the “bowing around,” or “circumnutation” as it is called, in a continuously spiral manner (allowing for irregularities), one is inclined to assume that a batch of cells at one point precedes in its formation that of another, about  $120^\circ$  from the former, just as is the case with single cells in the apex of the stem of *Equisetum* or horse-tail.

Darwin has given us many diagrams of traces, both of roots and stems, circumnuting, so the reader can consult them in his work on *The Movements of Plants*.

Circumnutation of a stem, therefore, may be assumed to result from the process of growth in a definite manner. Perhaps the most conspicuous case is seen in the movements of climbing or twining stems. Darwin attributed this to the elongated shoot bending or nodding around, in search, as it were, of a support. As soon as the stem touches another all motion is arrested below the point of contact, while the upper part continues to nutate, and so it winds itself round the support. Sachs calls attention to an omission, that the apex in consequence of the continued elongation of the stem, really moves in a spiral or corkscrew-like manner. This may perhaps facilitate the twining process.†

Tendrils also circumnutate until the tip has coiled round some object (by haptotropism); having acquired a sensitiveness to touch, the previously straight tendril then coils itself into spirals, as many times in one direction as in the opposite. This is effected by means of crank-like straight lengths rotating. I have described this in detail elsewhere.‡

The circumnutation of more or less completely formed organs, such as leaves and tendrils, seems to require some other interpretation than apical growth; and at present there does not appear to be any satisfactory explanation of this phenomenon.

\* See Fig. 111 in Sach's *Text Book of Botany*, p. 143.

† Darwin, however, appears to recognize this fact, for he says: “The belief that twiners have a natural tendency to grow spirally, probably arose from their assuming a spiral form when wound round a support, and from the extremity, even whilst remaining free, sometimes assuming this form.”—*Climbing Plants*, p. 17.

‡ *Jour. R. Hort. Soc.*, vol. xxxiv. p. 417.



Of course there are many more cases of special character, but the reader is referred to Darwin's two books, *Climbing Plants* and the *Movements of Plants*, which supply an abundance of information.

In conclusion, I would summarize what appear to be important procedures in Nature.

1. The external stimulus is the *cause* (by means of the responsive power of the organism) of a definite or special *structure* in adaptation to it; *e.g.* light and shade causing polarity.

2. If the *direction* of the stimulus be changed, the organ may *move* so as to put itself in adjustment with it; *e.g.* Phototropism, Hydro-tropism, &c.

3. The *tendency* only, to produce the structure may be hereditary; *e.g.* in the formation of adhesive pads in *Ampelopsis hederacea*.

4. The structure itself may be hereditary and be more or less completely formed *before* the influence can act; *e.g.* in the formation of adhesive pads in *A. Veitchii*. Such is the inheritance of acquired characters.

5. The *direction* of the growth of the organ can be hereditary apart from the presence of the original stimulus which caused it; *e.g.* the erection of shoots laid horizontally (originally due to light) in total darkness.

## THE INTRODUCTION OF THE TULIP, AND THE TULIPOMANIA.

By Mr. W. S. MURRAY, F.R.H.S.

[Read March 9, 1909.]

DURING the preparation of this paper on the introduction of the Garden Tulip into Europe and the subsequent craze or gamble in the seventeenth century, I have had the privilege of consulting the magnificent library belonging to Mr. Krelage, and at the outset I take the opportunity of thanking him for his kindness and courtesy in allowing me free access to it.

The first mention of the introduction of the Garden Tulip into England is made by Richard Hakluyt, who, in 1582, in his "Remembrances of Things to be Endeavoured at Constantinople," says: "And now within these four years there have been brought into England from Vienna in Austria divers kinds of flowers called Tulipas, and these and others procured thither a little before from Constantinople by an excellent man called M. Carolus Clusius."

Hakluyt was, however, wrong in attributing the honour of introducing the Tulip from the Levant to Clusius.

When Augerius Ghislenius Busbequius, the Ambassador of the Emperor Ferdinand I. to the Sultan, was travelling to Constantinople in the year 1554, he saw this flower for the first time in a garden between Adrianople and Constantinople. The most remarkable passage in his letters on his journey reads as follows: "As we passed, we saw everywhere abundance of flowers, such as the Narcissus, Hyacinths, and those called by the Turks Tulipan, not without great astonishment on account of the time of the year, as it was then the middle of winter, a season unfriendly to flowers. Greece abounds with Narcissus and Hyacinths, which have a remarkably fragrant smell; it is indeed so strong as to hurt those that are not accustomed to it. The Tulipan, however, have little or no smell, but are admired for their beauty and variety of colour. The Turks pay great attention to the cultivation of flowers, nor do they hesitate, though by no means extravagant, to expend several aspers for one that is beautiful. I received several presents of these flowers, which cost me not a little."\* The assertion that the Turks call the flower Tulipan is founded upon a misunderstanding, as the only Turkish name for Tulip is "Lale." The interpreter to Busbequius may have described the flower as being similar to the Turkish headgear, the fez, which is the shape of a cup. "Dubbend" is a Persian word for Nettle-Cloth, such as the Turks use as a fez, and from which Europeans derive the word turban.

Some few years later, in 1559, Conrad Gesner saw the first Garden Tulips that were grown outside Turkey growing in a garden at Ausburg,

\* *Busbequii Ep. Basiliae*, 1740, p. 36.



and described them in 1561.\* He says: "In this year of our Lord 1559, at the beginning of April, in the garden of the ingenious and learned Councillor John Henry Herwart, I saw there a plant which had sprung from seed which had been procured from Byzantia, or as some say from Cappadocia. It was growing with one large reddish flower, like a red lily, having eight petals of which four are outside, and just as many within, with a pleasant smell, soothing and delicate, which soon leaves it." Levier points out that, according to the description, the smell, and its early blooming, it is known as a spring Tulip, which to-day is described as *Tulipa suaveolens*, and not as *Tulipa Gesneriana*, and it may be assumed that these Tulips grown at Ausburg were grown from seed brought home, or sent home, by Busbequius.

Clusius in his works does not refer to the Ausburg Tulips, for in comparing the different dates the earliest is 1593, when Clusius came to Vienna, and there met Busbequius, from whom he obtained Tulip seeds, as he mentioned in his "History of Rare Plants,"† and as he makes no earlier reference we may take it that these seeds yielded the first Tulips that Clusius owned. Later, Clusius tells us he made experiments as to the comestibility of the bulbs, and in the year 1592 he instructed the apothecary, J. Muler, of Frankfort, to preserve some in sugar, as was done with the bulbs of the Orchids, and he found them far superior in taste and sweetness to the latter. In 1593 Clusius was appointed Professor of Botany at Leiden, but the Tulip found its way into Holland before Clusius and probably quite independently of him. In the "Historisch Verhaal," of April 1625, Vol. ix. 9th vers', Nicolas Wassenaer writes: "The first Tulip seen in Amsterdam was in the garden of the apothecary Walich Zieuwertz, to the great astonishment of all the florists; but they increased considerably after the celebrated botanist Dr. Clusius came to Leiden, who, besides Tulips, brought with him many other rare plants, such as the Hyacinth of Peru, which was sold for 40 florins, also the first Crown Imperial; and that Dr. Clusius now charged such an extortionate price for his Tulips, so much indeed that no one could procure them not even for money. Plans were made by which the best and most of his plants were stolen by night, whereupon he lost courage and the desire to continue their cultivation; but those who had stolen the Tulips wasted no time in increasing them by sowing the seeds, and by this means the seventeen provinces were well stocked."

As early as 1590 Joh. Hogeland grew the Tulip in Leiden,‡ and he possibly procured them from one George Rye, a merchant of Mechlin, who made a study of plants and who cultivated Tulips that he had received from an Eastern merchant at Antwerp.§

Clusius divided his Tulips into three classes in accordance with their time of flowering—*Praecoces*, the early flowering, *Serotinae*, the late, and *Dubiae*, those flowering between the two. He does not lose sight of the fact that such a division could not be of importance, inasmuch as he says explicitly (l.c. p. 147) that he has grown from the same seed Tulip *Praecox* and some single plants of the other two species. Parkinson, however, was stricter in his mode of division, and says in his "Paradisus,"

\* *De Hortis Germaniae*, &c., p. 213.

† Clusius, l.c. 147.

‡ p. 142.

§ Clusius, l.c. 150.

1629, "The chief division of Tulipas is into two sorts—*Praecoces*, early flowering Tulipas, and *Serotinae*, late flowering Tulipas. For that sort which is called *Mediae* or *Dubiae* do near participate with the *Serotinae*"; further, he denies the possibility of producing a *Praecox* flower from the seed of a *Media* Tulip, although, as he says, "I know Clusius, an industrious, learned and painful searcher and publisher of these rarities, saith otherwise." Miller in his "Gardener's Dictionary," 1733, says, "Tulips are usually divided into three classes, but there is no occasion for making any more distinctions than two, viz. early and late blowers," and he enumerates five rules of beauty for the Florist's Tulip, according, as he says, "to the characteristics of the best florists of the age."

1. It shall have a tall strong stem.
2. The flower shall consist of six leaves, three within and three without; the former ought to be larger than the latter.
3. Their bottom should be proportioned to their top, and their upper part should be rounded off, and not terminate in a point.
4. Their leaves should neither turn inward nor bend outward, but rather stand erect, and the flower should be of a middling size, neither over large nor too small.
5. The stripes should be small and regular, arising quite from the bottom of the flower, for if there are any remains of the former self-coloured bottom, the flower is in danger of losing its stripes again. The chives (stamens) should not be yellow, but a brown colour. When a flower has all these properties it is esteemed a good one.

Laubach tells us of two Turkish manuscripts procured by Von Diez, and now in the Archives of Berlin. The first of the two books, entitled "The Habit of Flowers," was written by the Sheik Mohammed Lalezari, who flourished in the reign of Sultan Achmed III., 1703–1730, and wrote also for the Grand Vizier Ibrahim Pasha, 1718–1730. This appears from the first page of the book, which says: "This is the booklet which was made by order of the late Ibrahim Pasha." Lalezari, a name which probably means Tupilanist, tells us that he stood in great esteem by the Sultan, who gave him the pet name of Schukjuf Perweran (Connoisseur of Flowers), and in his treatise deals exhaustively in two chapters with the Tulip. The first of these deals with twenty species and explains their points of beauty, whilst the second chapter contains directions concerning the cultivation of the Tulip bulb and seeds. Reference is made to numbers of Tulips and Narcissi with such names as 'Mihir Sulemani' (Beloved Sulemans), 'Ferah Efza' (Gladness increasing), and so on.

The second manuscript bears the title "Acceptable and Beautiful." It presents a systematically arranged catalogue of various sorts of one flower, but is not explicit as to the name of that flower, the origin of the seed, and the description of the bloom. Von Diez gives a translation as follows: "As the colour of the violet, curved as the form of the new Moon, her colour is well apportioned, clean, well proportioned, almond shape, needle like, ornamented with pleasant rays, her inner leaves as a



# Lijste van eenighe Tulpaen /

Verkocht aende meest-biedende / op den 5. Febhuarij 1637. Op de  
 Saal vande Nieuwe Schutters Doelen / int huysen vande E. Heeren Wedes-Gezellen  
 ende Doochden / ghehoormen van Wouter Bartelmiesz. Winckel / in syn Leven Cadeleyn  
 vande Oude Schutters Doelen tot Alkmaar.

|                                                                |       |
|----------------------------------------------------------------|-------|
| Inden eersten.                                                 |       |
| En verandende Boter-man van 563. Afsen gheplant.               | 263.  |
| En Schapio, van 82. Afsen gheplant.                            | 400.  |
| En Parragon van Delft of Mols-wijk, van 234. Afsen gheplant.   | 605.  |
| En Bruyne Purper, van 320. Afsen gheplant.                     | 2025. |
| En Viferoy, van 410. Afsen gheplant.                           | 3000. |
| De Monaffier, van 510. Afsen gheplant.                         | 830.  |
| En vroeghe Blijenburgher, van 443. Afsen gheplant.             | 1300. |
| En Gouda, van 287. Afsen gheplant.                             | 1320. |
| En Julius Cefer, van 82. Afsen gheplant.                       | 690.  |
| De Tulpa Kos, van 477. Afsen gheplant.                         | 300.  |
| En Botterman, van 400. Afsen gheplant.                         | 405.  |
| En Schapekley, van 245. Afsen gheplant.                        | 375.  |
| En Bellaart, van 390. Afsen gheplant.                          | 1520. |
| En Parragon van Delft of Mols-wijk, van 294. Afsen gheplant.   | 650.  |
| En Amersal Liefkens, van 59. Afsen gheplant.                   | 1015. |
| En Viferoy, van 658. Afsen gheplant.                           | 4200. |
| De Monaffier, van 512. Afsen gheplant.                         | 920.  |
| En vroeghe Blijen-burgher, van 171. Afsen gheplant.            | 900.  |
| En Gouda, van 244. Afsen gheplant.                             | 1500. |
| En Tulpa Kos, van 485. Afsen gheplant.                         | 305.  |
| En Botterman (schoon), van 246. Afsen gheplant.                | 250.  |
| En wit Purper Ieroen, van 148. Afsen gheplant.                 | 475.  |
| En Parragon van Delft of Mols-wijk, van 112. Afsen gheplant.   | 500.  |
| En Aauwte Vekus, van 52. Afsen gheplant.                       | 510.  |
| En Sjery Katelijn, vande beste 3007 / van 619. Afsen gheplant. | 2610. |
| En Amersal van der Eyk, van 446. Afsen gheplant.               | 1620. |
| En Grebber, van 97. Afsen gheplant.                            | 515.  |
| En Gouda, van 156. Afsen gheplant.                             | 1165. |
| En Tulpa Kos, van 117. Afsen gheplant.                         | 205.  |
| En Parragon Schilder, van 106. Afsen gheplant.                 | 1615. |
| En Laroij, van 306. Afsen gheplant.                            | 510.  |
| En Sjeryna by, van 129. Afsen gheplant.                        | 755.  |
| En Fama, van 158. Afsen gheplant.                              | 700.  |
| En Fama, van 130. Afsen gheplant.                              | 605.  |
| En Of-ter van Sjery Katelijn, van 27. Afsen gheplant.          | 1280. |
| En Somer-Schoon, van 368. Afsen gheplant.                      | 1010. |
| En Amersal vander Eyk, van 214. Afsen gheplant.                | 1045. |
| En Parragon Kakeleyn, van 100. Afsen gheplant.                 | 450.  |
| En Gouda, van 127. Afsen gheplant.                             | 1015. |
| En Amersal Katelijn, van 181. Afsen gheplant.                  | 225.  |
| En ghevlamde Iacot, van 100. Afsen gheplant.                   | 94.   |
| En Wit-Purper van Buscher, van 134. Afsen gheplant.            | 110.  |
| En Wit-Purper van Buscher, van 315. Afsen gheplant.            | 245.  |
| En Wit-Purper van Buscher, van 481. Afsen gheplant.            | 295.  |
| En Parragon Liefjes, van 348. Afsen gheplant.                  | 730.  |
| En Parragon Liefjes, van 300. Afsen gheplant.                  | 705.  |
| En Parragon Liefjes, van 200. Afsen gheplant.                  | 500.  |
| En Troyaen, van 470. Afsen gheplant.                           | 720.  |
| En Troyaen, van 252. Afsen gheplant.                           | 500.  |
| En Troyaen, van 167. Afsen gheplant.                           | 400.  |
| En Ian Geruick, van 203. Afsen gheplant.                       | 210.  |

Doet te worden spondelighg herrocht / en Admirad van Cuckghapen / met een cleyn  
 Afsen vande Iste / t'lamen boog 5200. Guldens.

En Twee Spakenfons / t'lamen boog 3800. Guldens.

Doet den verhegghen Planten en Boer 2017 t'lamen boog 12467. Guldens.

|                                                               |       |
|---------------------------------------------------------------|-------|
| En swymende Ian Gerrietz, van 925. Afsen gheplant.            | 210.  |
| En swymende Ian Gerrietz, van 80. Afsen gheplant.             | 51.   |
| En Bruyne Blaauwe Purper van Kouper, van 790. Afsen gheplant. | 320.  |
| En Lantmeier, van 277. Afsen gheplant.                        | 365.  |
| En Lantmeier, van 71. Afsen gheplant.                         | 175.  |
| En Parragon de Man, van 148. Afsen gheplant.                  | 250.  |
| En Bruyne Lack vander Meer, van 365. Afsen gheplant.          | 215.  |
| En Amersal vander Eyck, van 92. Afsen gheplant.               | 710.  |
| En Fama, van 104. Afsen gheplant.                             | 440.  |
| En Brabanton Bol, van 524. Afsen gheplant.                    | 975.  |
| En Grebber, van 523. Afsen gheplant.                          | 1485. |
| En Brabanton, van 542. Afsen gheplant.                        | 1010. |
| En Brabanton, van 346. Afsen gheplant.                        | 835.  |
| En Schapeklay, van 97. Afsen gheplant.                        | 235.  |
| En Gouda, van 160. Afsen gheplant.                            | 1165. |
| En Gouda, van 82. Afsen gheplant.                             | 765.  |
| En Gouda, van 63. Afsen gheplant.                             | 635.  |

Drie narbolghende Preceelen zijn by de  
 Aes verkocht / ende te leveren als de  
 Vollen acht daghen wt der Aerden  
 sin gheweest.

|                                                                |       |
|----------------------------------------------------------------|-------|
| Inden eersten 1000. Afsen Gooze Gepluymerende.                 | 280.  |
| Doet 1000. Afsen Legrandes.                                    | 780.  |
| Doet 1000. Afsen Violette Gevlamde Rotganfen.                  | 805.  |
| Doet 1000. Afsen Aenverfen, vande ghemeene font.               | 910.  |
| Doet 1000. Afsen Aenverfen.                                    | 905.  |
| Doet 1000. Afsen Lanoijs.                                      | 500.  |
| Doet 1000. Afsen Zay-Blommen vande Kakeleyn, vande beste font. | 1000. |
| Doet 500. Afsen Lak van Rijn.                                  | 160.  |
| Doet 1000. Afsen Zay-Blommen, vande ghemeene font.             | 495.  |
| Doet 1000. Afsen Nieu-Burgers.                                 | 410.  |
| Doet 500. Afsen Nieu-Burgers.                                  | 235.  |
| Doet 1000. Afsen Ian Symoniz.                                  | 140.  |
| Doet 500. Afsen Ian Symoniz.                                   | 70.   |
| Doet 1000. Afsen Macke.                                        | 300.  |
| Doet 1000. Afsen Macke.                                        | 300.  |
| Doet 1000. Afsen Recktors.                                     | 310.  |
| Doet 1000. Afsen Violette ghevlamde Rotganfen.                 | 725.  |
| Doet 500. Afsen Violette ghevlamde Rotganfen.                  | 375.  |
| Doet 1000. Afsen Late Blyen-Burgers.                           | 570.  |
| Doet 1000. Afsen Ducke-winkel.                                 | 210.  |
| Doet 1000. Afsen Petters.                                      | 730.  |
| Doet 1000. Afsen Wit-roep.                                     | 705.  |
| Doet 1000. Afsen Wit-roep.                                     | 725.  |
| Doet 1000. Afsen Petters.                                      | 705.  |
| Doet 1000. Afsen Tornay Kakeleyn.                              | 705.  |
| Doet 1000. Afsen Tornay Rijkers.                               | 345.  |
| Doet 500. Afsen ghevlamde Branfons de Nou vijl.                | 130.  |
| Doet 1000. Afsen Senekoets.                                    | 105.  |
| Doet 1000. Afsen Aauwers.                                      | 900.  |
| Doet 1000. Afsen Oudemarders.                                  | 530.  |
| Doet 1000. Afsen Oudemarders.                                  | 510.  |

Deze hooftghemelde Moemen of Tul-  
 paas / syn verhecht ten pooffte vande  
 kinderen van Wouter Bartholmiesz. boog-  
 schepen / bedaght de Somme van 68333.

Fig. 1.

Record of a Tulip sale by auction held at the "Nieuw Schutters Doelen," Alkmaar, February 5, 1637, by order of the Governors of the Orphanage, under whose care were the children of Wouter Bartelmiesz, innkeeper of the "Oude Schutters Dollen," Alkmaar. The sale being held while the bulbs were still in the ground, the weight of each bulb when planted was given. These few bulbs realized 0,000 florins, or £7,500.

[To face p. 20.]



FIG. 2.--TULIPA DIEF (THE THIEF TULIP) [Copyright: James Murray & Sons.]

No. 1, Scarlet with yellow border; No. 2, Claret-wine colour.

[To face p. 21]



well, as they should be, her outer leaves a little open, as they should be; the white ornamented leaves are absolutely perfect, she is the chosen of the chosen." Now although nothing is said as to which flower is described, Von Diez, quite rightly, thinks that only Tulips can be meant. The flower described would be termed nowadays a 'Bybloemen,' and, as the author enumerates no fewer than 1,323 varieties, although the full description is given of 74 only, one can form an estimate of the many varieties of the Tulip under cultivation in those days. Von Diez further draws attention to the twenty rules of beauty detailed by Lalezari, which corresponded with those of Europe with one exception. The perfect Turkish Tulip, according to Lalezari, had pointed petals on the 4 to 6 scale; the Western taste of that time, however, demanded a possible rounded form of petal. It seems that the Tulips originally exported from the Turks all had pointed petals. All the varieties illustrated by Clusius are of this form, and of the illustrations in the works of Parkinson, Langlois and Passeus, but very few are to be found with rounded petals, in striking contrast to the demand made by fashion in the second half of the seventeenth century. Von Diez deduces that these Turkish rules were adhered to at the time of the importation of Tulips into Europe, and have been accepted by Europeans. But his contention is not supported by the writings in the eighteenth century manuscripts of Lalezari, and inasmuch as the Tulip was cultivated in Europe at the end of the seventeenth century, it is possible that a retrospective action towards the Turks was effected; in other words, that the Turks copied from the Europeans the ways and means of identifying the points of beauty, and the classification of the plants, but it is extremely unlikely that a Turk should have copied anything from a disbeliever, and moreover Lalezari refers to former connoisseurs of flowers who prohibited the watering of Tulips until the growth was well above the ground, and describing the *Narcissus* he says some of the old teachers had laid it down that it was necessary to lift the yellow *Narcissus* every third year. This confirms that he had researched in older Turkish writings of which we do not know, and that he draws his conclusions from old Turkish grounds, and from these he obtained the names, and recognized points of beauty.

It is possible that the nomenclature and rules of beauty developed in an analogous way. Certainly before the importation of the Turkish flowers into Europe they were unknown, and at the time of Busbequius the Tulip was held in high esteem by the Turks. These rules of beauty apply only to the florist's or Amateur's Tulips known as 'Breeders' (self colours), 'Bizarres' (those with a yellow ground lined or marked with purple and scarlet of different shades), 'Bybloemens' (having a white ground lined or marked with violet or purple of different shades), and 'Roses' (those marked or striped with rose, scarlet, crimson, or cherry colour on a white ground), and they have been dealt with in two excellent papers which have been published in the *Journal of our Society*, one by Rev. F. D. Horner,\* and one by Mr. A. D. Hall.†

Seeds sown from either of these four classes of Tulips produce invariably self colours, which after an indefinite period "break" or

\* Vol. xv., 1893.

† Vol. xxvii., 1902.

change into the colours of one of the three groups, Bizarre, Bybloemen, or Rose. This character of the Tulip has no floral parallel, and at present no scientific explanation has been offered. Tulips are now seldom grown from seeds, as the process although interesting is tedious, taking usually ten years before definite results are obtained, and we are continually getting new and good varieties from the bulbs themselves, which produce spontaneously blooms of more or less the same character but entirely different, either rectified or self-coloured. Two well known varieties from the early flowering class, single 'La Reine' and double 'Murillo' illustrate this. From 'La Reine' we have a yellow, 'Herman Schlegel' or 'Primrose Queen'; a pink, 'Rose La Reine'; a deep rose, 'Reine des Reines'; a white, 'White Hawk'; and further from 'White Hawk,' 'Red Hawk'; 'Flamingo,' pink; 'Ibis,' deep rose; and 'Callipso,' cream. From 'Murillo,' which is itself a pale pink, has arisen a yellow 'Tea Rose' or 'Primrose Beauty'; 'Harlequin,' striped; a pure white, 'Purity' or 'Schoonoord'; 'Paeony White'; 'Meister van der Hoef,' pure yellow; and a dark rose and a mauve, which are as yet unnamed. On our farm last season was noticed in a bed of 'Tournesol' a pure yellow of that variety.

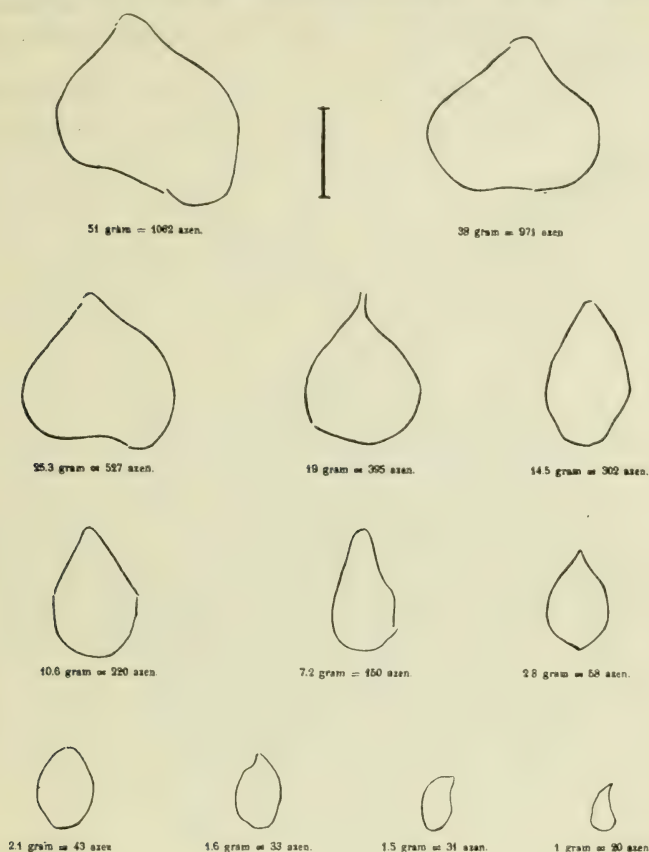
One of the most remarkable variations arising in the Tulip is a form of atavism which occurs in all kinds of garden Tulips, but especially in Parrot Tulips. Occasionally a specimen will lose its character and revert to a form of Tulip with narrow flowers; these have no commercial value and are at once destroyed, but from a scientific point of view they are of the greatest interest. This Tulip is known in Holland as 'Tulipa dief,' or Thief Tulip (fig. 2), probably because it replaces one of some value; the two forms are a deep rose, and a red with yellow border. These have been planted and are found to be constant. The conspicuous characteristic lies in their pointed petals. The first leaf of the largest offset develops in a curved form, that is, the tip of the leaf is elongated into a runner which drives horizontally into the soil and to which is attached an offset. The character of the bulb itself is entirely changed to that of an angular form, similar to the bulb of an unbloomed Parrot Tulip, but lighter in colour. I think this similarity between the bulb of the Parrot Tulip and that of the 'Tulipa dief,' rather than the Parrot Tulip being subject to atavism, explains their frequent appearance among the Parrot Tulips. Parrot Tulips have either a red or a yellow ground, the latter therefore belonging to the 'Bizarre' group. That Parrot Tulips are a sport from the late Amateur Tulips has been proved recently at Haarlem, where a fine late Tulip produced unexpectedly a Parrot Tulip of the same colour.\*

The late Amateur Tulips more especially 'Roses' and 'Bybloemen' were among those most sought for and purchased for such large sums at the height of the Tulipomania. The many anecdotes relating to this remarkable mania are well known, and have been copied and possibly enlarged upon by one writer from another, and need not be mentioned here. How or when the mania commenced we do not know, for to find the time with certainty it is necessary to discern where fair trading ends and speculation commences. Munting, in his "Beschrijven der Kruyden," places the dates as 1634-1637, but M. Van Damme has written to me

\* *Florilegium Harlemense*, Tab. 53.



stating that he has recently discovered in the Archives of Haarlem papers relating to disputes over Tulips as early as 1611, but as I have not yet seen them I cannot say what bearing they have upon this point. Munting says that the mania originated in France, where the nobility, especially in Paris, gave hundreds and sometimes thousands of florins for a single Tulip bloom; the more beautiful the colour, the higher the price paid. But we have already seen that Tulips were greatly prized when Clusius was at Leiden, for those he grew were coveted and stolen. It would seem



[Copyright: James Murray & Sons.]

FIG. 3.—DIAGRAMS SHOWING RELATIVE SIZES OF BULBS WEIGHING 20 AZEN TO 1062 AZEN.

(The vertical line in the middle of the top row represents 1 inch.)

more probable that the demand increased with the number of amateur collectors, who would pay high prices for a fashionable or rare specimen, just as to day large amounts are paid for certain postage stamps; but the period of the actual gamble in the bulbs, which was entered into by weavers, carpenters, carmen, and even servant girls, may not have commenced till 1634.

Wassenaer (1623–1625) commented upon the principal varieties of the year; the 'Semper Augustus' is described as the most valuable and

beautiful. In 1623 he wrote: "The 'Semper Augustus' has been the most prominent variety of the year; the colour is white and red, tinted blue underneath. No Tulip has been held in higher esteem, and one has been sold for thousands of florins, and yet the seller was himself sold (so he said), for when the bulb was lifted he noticed two lumps on it which the year following would become two offsets, and so he was cheated of two thousand florins." He says further: "The offsets that the bulbs give are the interest, while the capital remains intact." He also considered that bulbs were a safe investment, for one might carry one's capital about in the pocket, and if molested by footpads would not have it stolen as with gold or diamonds.

One bulb which cost sixty florins has in a short time paid 20 per cent. by offsets, reckoning them at only 6*d.* each. Wassenauer tells us that in 1624 the 'Augustus' still kept its former reputation, and that there were only twelve in existence. Averaging large and small they could be bought at 1200 florins each. In 1625, 3000 florins were offered for two of these bulbs, but the owner could not be induced to part with them, for, considering that he was the only one possessing the rare bulbs, no one else could procure them, he put his own value, which was very high, on them.

It was not to be wondered at that such an easy and profitable business soon found favour, as all that was necessary was to possess a few Breeder Tulips which could be grown in almost the smallest garden. The growing of tulips from seed had the fascinating possibility that some tulip of exceptional merit and value might be produced. A proof of this is given by Gaergoedt in an answer to Waermond's question, "How the flowers got so many names." He says: "If a change in a Tulip is effected one goes to a florist and tells him, and it soon gets talked about. Everyone is anxious to see it. If it is a new flower each one gives his opinion; one compares it to this, another to that, flower. If it looks like an 'Admiral' you call it a 'General,' or any name you fancy, and stand a bottle of wine to your friends that they may remember to talk about it."

The whole business was based on confidence, and was quite impossible to control, as one could not see when buying the bulb the flower it

FIG. 4.—FLORA'S FOOL'S CAP;

OR,

Representations of the wonderful year 1637, when one fool hatched another; the people were rich without property, and wise without understanding.

This print, which appears in the second edition of the conversations of Waermond and Gaergoedt, published in 1734, depicts a tent in the shape of a fool's cap, in which are several florists weighing Tulips with goldsmiths' scales. Outside hangs a sign, as at an inn, showing two fools fighting, and inscribed "In the two Bulb Fools." In the background is the goddess Flora on an ass being beaten and scolded by disappointed florists. Above the heads of those on the extreme right is a rake or claw, meaning that Flora had raised their hopes of wealth to the highest, but they are now in abject poverty.

On the left is one well dressed and smiling. This is one of the few successful speculators, and he is turning a deaf ear to one of his victims. On the extreme left is Satan with a rod and line at the end of which is a fool's cap; on the line are a great many sale notes of Tulips, and in his right hand is an hour glass, meaning "The time is up."

In the foreground are some florists whose reason has left them, throwing their Tulips on the rubbish heap.



# FLORAES GECKS-KAP

of  
 Afbeeldinge van't wonderlijcke Jaer van 1637, doen d'een Geck d'ander uytbreide  
 de Luy Rijk sonder goet, en Was sonder verstant weeren.



FIG. 4.—FLORA'S FOOL'S CAP.

[Copyright: James Murray & Sons,

[To face p. 24.

ROTGANS.

Rose striped on white ground.



BRUIN PURPER.

Purple brown on white ground.

Sold at Alkmaar, February 5, 1637. 320 azen, 2025 florins; Waermondt & Gaergoedt, 60 azen, 1300 florins; 50 azen, 1100 florins.



ADMIRAL LIEFKENS.

Crimson striped on white  
ground.

Sold at Alkmaar, Feb-  
ruary 5, 1637. 59 azen,  
1015 florins; Waermond  
& Gaergoedt, 400 azen, 4400  
florins.



*Admiral Liefkens,*

ADMIRAL VAN DER EYCK.

Scarlet striped on white  
ground.

Sold at Alkmaar, Feb-  
ruary 5, 1637. 440 azen,  
1620 florins; 214 azen,  
1045 florins; 92 azen, 710  
florins.

*Admiral van der  
Eyck*

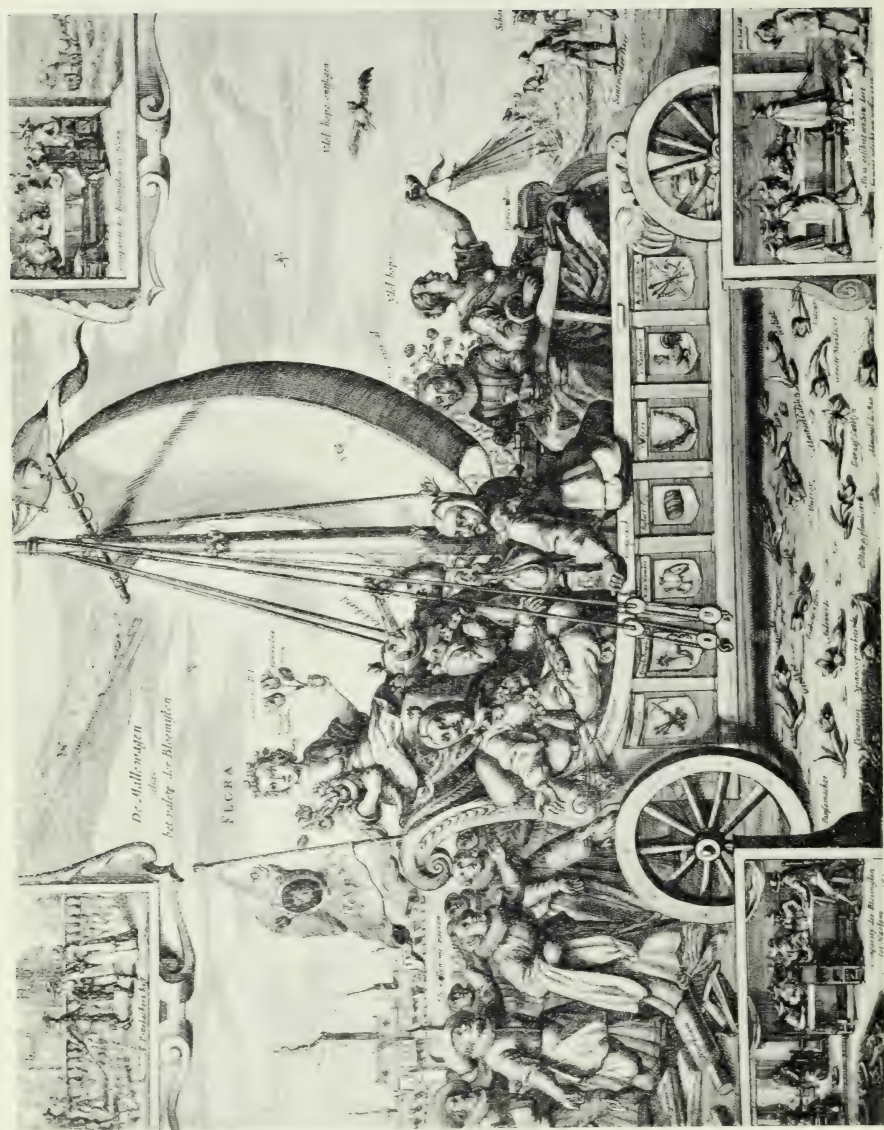


FIG. 7.—THE FOOL'S WAGON.

[Copyright: James Murray & Sons.

[To face p. 25.



would produce, and in the event of the same turning out different from that expected, it could not be asserted with certainty that fraud had been committed. That such fraudulent practices occurred we have ample evidence in "Het t' Zamenspraeken, between Waermond't en Gaergoedt." Gaergoedt says, "It is right that last year I bought a bulb or two that are not what I bought them for, but what is that compared to the numbers bought?" but Waermond't says that his cousin had spoken to people who had bought pounds (in weight) of bulbs purporting to be of such varieties as 'Crowns,' but which were nothing better than *early* double coloured, and even single colours that one may see in any garden.

The "t' Zamenspraeken," or three conversations between Waermond't and Gaergoedt, was published first in 1637 at Haarlem by Adrian Roman, and purports to be the conversations of two weavers, and from these conversations we learn the way business was transacted during the craze. Bulbs that sold at so much each, or by the dozen, were now sold by weight of so many azen (fig. 5), a small weight less than a grain, in the same way as gold or diamonds. In growing numbers tradesmen and artificers adopted the calling of cultivators and dealers of Tulips, selling their tools and their business, and borrowing money on their houses. The constantly increasing profits from their speculations were to be ample compensation for everything, and now began in earnest the Tulip mania. At the commencement bulbs were sold at the time of delivery from the end of June, when they were taken out of the ground, to September, when it was time to plant them again; later the business extended over the whole year, delivery in summer being agreed upon. As now the prices varied according to the demand; speculators contrived to get the Tulip trade into their hands; the bulbs became therefore a secondary consideration as bulbs, and became the object of a regular exchange and gamble.

Collegiums or clubs were formed and held at the inns, which became Tulip exchanges, and we learn that there were two methods of conducting business. The one as selling "met de Borden or Schijven," the other "in het Ootjen." The first is described by Gaergoedt, who says to Waermond't: "If you wish I will sell you a 'Cargasoentje,' and because you are a good man and my special friend, you may have it for fifty florins less than I would take from anyone else, and if you do not

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FIG. 7.—THE FOOL'S WAGON.

The original of this rare print, painted probably by Hendrik Pot, who, according to Burger Musées de la Holland, was from 1633–1639 lieutenant in the Guards at Haarlem, shows us a chaise-like car, in the middle of which a sail is fastened, and this, moved along by the wind, carries Flora, who in her arm holds a horn of plenty in which are Tulip blooms, and in her left hand three blooms—"Semper Augustus," 'General Bol,' and 'Admiral van Horn.' In the body of the car are three florists decked out with Tulip blooms, and who are named "Good-for-nothing," "Eager Rich," and "Tippler." In the front of the car are two women, one named "Save All" (Miser) and the other "Idle Hope," and from whom the bird Hope has escaped.

A crowd runs after the car, calling out "We will all sail with you," and in their eagerness discard and trample on their weaving-looms, &c. In the foreground are various Tulip blooms, and on the extreme right is a similar sailing car wrecked. At the corner of the picture are small insets showing Pottebackers Garden and Club rooms at Haarlem and Hoorn.

make 100 rijksdaelers profit, I will make up the difference." Waermondts replies: "What a splendid proposal! but suppose I bought the bulb, how shall I get rid of it? Will the people come to me or must I go to them and offer it for sale?" Gaergoedt: "I will tell you. You must go to an inn; I will show you several, as I know but few where there are no collegiums (clubs). When there you must ask if there are any florists. When you are admitted into their club room, because you are a stranger some will quack like a duck, others will say, 'I spy a stranger,' but do not take any notice. Your name will be written on a slate (or black-board)," and then he goes on to describe the method of selling "met de Borden." It was not permitted for one to offer goods for sale, but one might ask what his neighbour had to sell, thus indicating that he himself had something to sell. He could say for instance: "I have more yellows than I can use, but I want some white." Having found a possible purchaser, each, as Gaergoedt tells us, "obtains a small slate or Borden, and each chooses an arbitrator; the seller then goes to the arbitrators, and demands, for example, 200 florins for his goods; the buyer goes to the arbitrators, hears what has been demanded, pretends to be in a rage, and bids as much too low as the seller has asked too much. The arbitrators then fix the value, and write it on the slates of both parties, calling out the amount aloud. If both agree to the amount, the writing must remain upon the slate and the deal is finished. On the contrary, if both rub the writing out, the sale is off; if either agrees and allows the writing to remain, the other must pay the charges as fixed by the club; in some places two stuivers, in others three, five, or six stuivers. But if a sale is made the buyer pays half a stuiver on each florin, to the amount of three florins on each transaction of 120 florins or higher. This deposit was known as wine money, the seller allowing half of it back again to the purchaser upon settlement.

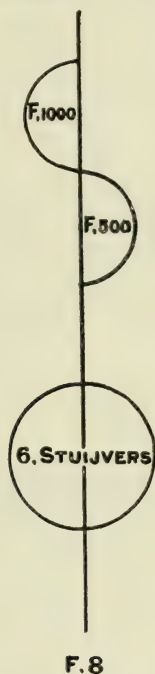
The procedure of sales "in het Ootjen" is also explained by Gaergoedt. Waermondts inquires, "Is there no other way of dealing beside 'met de Borden'?" Gaergoedt replies, "Yes." When the Schijven or Borden have been round, a drawing is made upon the blackboard (fig. 8).

In the upper semicircle is written the thousands of florins, in the middle semicircle the hundreds of florins, and in the circle is "het Ootjen," in which the amount the highest bidder receives is written. Under the Ootjen, the tens of florins and stuivers are written. Now one asks, "Who will put something in the Ootjen?" If there is one willing, as there always appears to be, he places something in the Ootjen—say it is a "Gouda" weighing 30 azen. The auctioneer announces that the one who bids the highest shall receive a double stuiver, or three, four, five, or even six stuivers, according to the custom of the place, and as the company have arranged. The bidding commences at, say, fifty florins, and continues till there is silence, or no further bids than, say, 1508 florins. Then the one at the slate or blackboard says, "Nobody bids, for the first time," again, "Nobody bids, before I finish." With that he makes three strokes (probably through the amounts written, viz., the thousands of florins, hundreds of florins, and tens of florins) and draws a circle round, and then says, "No one else, once," "For the second time," "Third," "Fourth and last time," and with this he draws a stroke



through the whole, and if the seller agrees, the bulb is sold, and the wine money is paid as "met de Borden," the purchaser receiving the money promised to the highest bidder, which amounts were known as "Drietjens." The wine money, besides paying for light and fuel, supplied the members of the club with tobacco, beer, &c., for Gaergoedt replies to an inquiry from Waermondts about the wine money, and says: "Yes. The wine money amounts sometimes to much more. I have often been to inns and eaten baked and fried fish and meat. Yes; chickens and rabbits, and even fine pastry, and drunk wine and beer from morning to

## TULIP GOUDA. 30. AZEN



### HIGHEST BID, 1508 FLORINS

FIG. 8.—DIAGRAM ON BLACKBOARD SHOWING FINAL BID OF 1508 FLORINS FOR THE TULIP 'GOUDA,' WEIGHING 30 AZEN, SOLD "IN HET OOTJEN."

three or four o'clock at night, and then arrived home with more money than when I left, and if I had speculated about twelve thousand florins the Drietjens would have been as plentiful as the raindrops from the thatched roof when it has rained."

It is not surprising that such an easy and luxuriant life attracted all kinds of ne'er-do-wells, who had no intention of ever paying for the bulbs purchased, but came solely for the "Drietjens," a state of affairs assisted by the fact that bulbs were often sold while in the ground, and were not paid for until delivery some time after, a system which led later to such disastrous complications. The crisis came unexpectedly, principally because connoisseurs had tired of their hobby, and had placed large

numbers of Tulips on the market, with the result that bulbs depreciated immediately.

Then came the panic and everyone wanted to sell and no one wanted to buy. Waermondts tells us, that on February 3, 1637, a few florists met at an inn, and endeavoured to push the trade again by holding a mock auction, but without result.

On February 24, 1637, delegates were appointed from the towns of Haarlem, Hoorn, Alkmaar, &c., who met at Amsterdam and drew up the following agreement: "That all sales of Tulips made to the end of November 1636 should be binding. Transactions after that date could be cancelled at the option of the buyer, upon payment of 10 per cent. of the amount purchased to the seller, providing notice is given before March 1637." But this was not accepted. Gaergoedt gives us an idea of the times when, pointing to Waermondts, he says, "When my buyer pays me I will pay you, but he is nowhere to be found."

1637 — 18 January 1637 bought from Pieter Willems van Rosven one 'Terlon,' weighing 275 azen when planted, for the sum of Three hundred & eighteen Florins, the Bulb planted in Cornelis Verwer's Garden. Wine Money 12 Stuijvers. F. 318. Wouter Tulleken.

1637

1637. January 18 bought from Pieter Willems van Rosven one 'Terlon,' weighing 275 azen when planted, for the sum of Three hundred & eighteen Florins, the Bulb planted in Cornelis Verwer's Garden. Wine Money 12 Stuijvers. F. 318. Wouter Tulleken.

[Copyright: James Murray & Sons.]

FIG. 9.—FACSIMILE AND TRANSLATION OF THE RECORD OF THE SALE OF A BULB.

The Law Courts became crowded and, as no one knew what to do, the Magistrates of the towns were asked to intervene.

A petition was handed to the Governors of Holland and West Friesland, at The Hague, pressing for the cancelling of all the transactions entered into during the past winter. In their reply the Court declared "there was not enough information in the papers furnished to enable the Court to come to a legal decision, but they advised the Magistrates to endeavour to induce the parties to come to terms in a friendly manner, and to keep the Court informed how matters were progressing."

A decree dated April 1637, issued by the Court of Holland, by which authority was to be given to the sellers to sell all Tulips sold for future delivery, after giving the buyer due notice, or hold them at their own risk, and that the buyer would be answerable for any differences in the amounts realized. Further, it was to be taken for granted that all Tulip contracts were to be suspended, and not acted upon until this matter had



VILCE ROIJ VAN ORANGEN  
 V.<sup>e</sup> (VICEROY D'ORANGE).

Violet striped on white.

Sold at Alkmaar, Feb-  
 ruary 5, 1637. 410 azen,  
 3000 florins; 658 azen,  
 4200 florins; Waermond  
 & Gaergoedt, 1000 azen,  
 6700 florins.



BRABANT.

Crimson striped on  
 white ground.

Sold at Alkmaar,  
 February 5, 1637.  
 542 azen, 1010  
 florins; 346 azen,  
 835 florins; 524  
 azen, 975 florins.

FIG. 10.

[Copyright: James Murray & Sons

[To face p. 28.



GENERAL KIFFING.  
Crimson striped on white  
ground.



*General  
Kiffing*

ANVERS.

Violet striped on white  
ground.

Sold at Alkmaar, Feb-  
ruary 5, 1637. 52 azen,  
510 florins.

*Anvers*

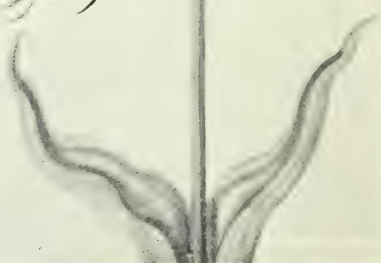


FIG. 11.

[Copyright James Murray & Sons.

[To face p. 29.



been settled by a legal decision. But as the edict promising legal adjustment never arrived, the contending parties were left to settle the matter between them as best they could.

Many discontinued trading and came to terms with their creditors paying 5 per cent. or 10 per cent. to get out of their bargain to take the Tulips. Munting tells us that his father had, in 1636, sold to one in Alkmaar a few bulbs for seven thousand florins, on the following conditions:—That the sale should remain binding if there should be no fall in prices within six months, otherwise the buyer could refuse the Tulips upon payment of 10 per cent., but “as the fall occurred within the six months, my father received seven hundred florins for nothing, but he was obliged to keep his bulbs. He would have preferred to deliver the bulbs, and receive the seven thousand florins.”

The caution displayed by the buyer seems to show that he was fully alive to the possibilities of a crisis.

Munting also gives extracts of several of the transactions, from some ledgers kept during the craze, some of which are mentioned in “t Zamen-spraeken” of Waermondt and Gaergoedt.

The example given below shows payment in kind. For one ‘Viceroy’ Tulip the following goods were given :

|                                        | Florins |
|----------------------------------------|---------|
| 2 loads of wheat . . . . . value       | 448     |
| 4 „ of rye . . . . . „                 | 558     |
| 4 fat oxen . . . . . „                 | 480     |
| 8 fat pigs . . . . . „                 | 240     |
| 12 fat sheep . . . . . „               | 120     |
| 2 hogsheads of wine . . . . . „        | 70      |
| 4 barrels of 8 florin beer . . . . . „ | 32      |
| 2 barrels of butter . . . . . „        | 192     |
| 1000 lb. of cheese . . . . . „         | 120     |
| A complete bed . . . . . „             | 100     |
| A suit of clothes . . . . . „          | 80      |
| A silver beaker . . . . . „            | 60      |
| Total . . . . .                        | 2500    |

The following is another example of a bookkeeper’s entry : “Sold to N. N. a ‘Semper Augustus,’ weighing 123 azen, for the sum of 4600 florins. Above this sum a new and well made carriage and two dapple grey horses and all accessories, to be delivered within four weeks, the money to be paid immediately.” Munting also gives a list of bulbs sold by weight in public auction, among which are :

|                                    | Florins |
|------------------------------------|---------|
| 59 azen Admiral Liefkens . . . . . | 1015    |
| 214 „ Van der Eyck . . . . .       | 1620    |
| 523 „ Grebba . . . . .             | 1485    |
| 106 „ Schilder . . . . .           | 1615    |
| 200 „ Semper Augustus . . . . .    | 5500    |
| 410 „ Viceroy . . . . .            | 3000    |
| 1000 „ Gouda . . . . .             | 3600    |

Referring to the ‘Viceroy’ sold in kind, we find at that time the value of a sheep was ten florins, or 16s. 8d. One can estimate what an enormous amount these sums represented.

In 1733 and 1734 there was a minor revival of the mania, when enormous sums were paid for Double Hyacinths, which occasioned the reprinting of the 't Zamenspraeken' of Gaergoedt, and Waermondts as a warning; and in the 'Florists' Magazine' of 1836 (vol. 4, p. 215) I find the following: "The well known taste of the Dutch for Tulips is not diminished. The new Tulip called the 'Citadel of Antwerp' has been purchased for 16,000 francs (£650 sterling) by an amateur at Amsterdam."

At the present day new varieties sometimes change hands for large sums, but a repetition of the mania is not likely to occur.



## CUCURBITACEOUS FRUITS IN EGYPT.

By Mr. T. W. BROWN, F.R.H.S.

MOST of the crops in Egypt are grown under irrigation, which necessitates the adoption of methods of cultivation different from those followed in countries where rain is the immediate source of the moisture in the soil. Again, in districts where the ancient system of flooding the land once each year is followed, the agriculture is necessarily different from that practised on land now under perennial irrigation and watered at all seasons. If we also remember that the water-wheels, ploughs, and other implements employed are of the most ancient patterns, it will be seen that the peculiarities of Egyptian agriculture are varied and picturesque.

Many Egyptian varieties of cultivated plants are of special interest. In this respect the somewhat numerous varieties of Egyptian cotton will at once occur to the mind, but the Cucurbitaceous plants are quite as interesting and perhaps not so well known as the cotton. Although they are not indigenous to the country, the introduction of several of the most useful members of the family must have taken place at very remote periods.

"We remember the fish which we did eat in Egypt freely, the cucumbers and the melons," was the plaint of the Israelites after leaving the land of their captivity. Whatever fruit may be meant by the word 'melons' in this passage, it is interesting to note that similar regrets are very often expressed in regard to the sweet melons and water melons of the present day by people leaving Egypt.

The kind of sweet melon most commonly grown, and known in Arabic as 'Shammam,' is a variety of the same species as the Queen Anne's Pocket Melon—*Cucumis Dudaim*. The latter plant is also occasionally met with, but, as in other countries, it is of ornamental value only. It is called 'Abou Shammam,' which means "the father of Shammams."

The ordinary 'Shammam'—*C. Dudaim aegyptiaca*—is a most delicious melon. There are three varieties of it, viz. the 'Geyeidy,' 'Weraki,' and 'Besusi.' The first is by far the most common. It is oblong in shape, about 30 cm. long, of an average weight of  $2\frac{1}{2}$  kilos., lightly furrowed, dark green, but becoming yellow between the furrows when ripe. The flesh is greenish white, melting and sweet. The 'Weraki' is a larger variety, but is less sweet than the 'Geyeidy.' The best variety is the 'Besusi.' The fruit is short, but it has a deeper and sweeter flesh than the others. This variety requires a comparatively heavy soil, and is grown chiefly on the island of Abou el Gheit, and Besus to the north of Cairo, whence its name. Owing to the delicacy of the skin, the greatest care has to be taken to protect the fruit from the direct rays of the sun. For this reason the cultivators usually sink the immature fruits in the soil, and dispose the branches so as to form a thick shade above.

Sickenberger in the "Contributions à la Flore d'Égypte" mentions a fruit which is intermediate between the 'Shammam' and the 'Abou Shammam,' but I have not seen it.

A very long club-shaped melon is sometimes cultivated on the banks of the Nile. This resembles the 'Shammam' in colour and perfume, but is tasteless, and otherwise of poor quality. At Cairo it is called 'quattah saidy.'

The melons belonging to *Cucumis Melo* are known in Egypt as 'qaoon.' They are represented by several varieties, all, however, being either netted or winter melons. The Cantaloupes are scarcely known outside the gardens of a few Europeans. The best known of the netted melons is the 'qaoon Santaouy.' This is a small, globular, and strongly-scented fruit. It is somewhat deeply furrowed, and has a light yellow skin with a close network of raised lines. The flesh is thin, light orange coloured, and very juicy. It is a late variety of melon, and does not appear in the market until the latter half of July, whereas the 'Shammam' is ready in the middle of May.

The 'Santaouy' is grown chiefly in the Delta, but a netted melon is cultivated in Upper Egypt also, under the name of 'qaoon saidy.' It is said to attain a large size, but the specimens which I have seen were not remarkable in this respect. It is a globular melon, somewhat deeply ribbed, and with a dark brown skin mixed with yellow and green. It has a thick sweet flesh of good quality.

Of the smooth-skinned melons, the most important is that known as the 'qaoon beledi,' which, like the 'qaoon saidy,' is cultivated chiefly in Upper Egypt. It is globular in form, and has a light yellow skin without furrows. The flesh is white, thick and very sweet, the average weight of the fruit being about 3½ kilos. At Cairo this is called 'qaoon Doumeyry' and sometimes 'qaoon Sohagi,' but neither this nor the 'qaoon saidy' comes to Cairo in large quantities. Other varieties are imported in large quantities from Smyrna, after the middle of August, when the Egyptian melons (Shammam) are finished. Mention must be made of an oblong melon called 'qaoon mahanaouy.' The only place where I have known this to be cultivated is Sohag, in Upper Egypt. A native grower of that place informed me that it sometimes attains a length of 50 cm. It is, however, tasteless and of little value.

Apart from these long melons, the most remarkable Cucurbitaceous fruit in Egypt is that known as 'agour' — *C. Melo Chate*, L. (Naud). As De Candolle points out, the name of the cucumber in modern Greek is 'angouria,' "from an ancient Aryan root which is sometimes applied to the water-melon, and which recurs for the cucumber in the Bohemian 'agurka' and the German 'gurke,' &c." The 'agour' of the Egyptians, however, bears no resemblance to a cucumber. It is oval in shape, but gradually tapering to a point at both ends. The length of an average-sized fruit is about 40 cm. It has a reddish-brown skin, covered with a close network of raised lines. The flesh is thin, orange-coloured, juicy, but not sweet. The 'agour' matures very quickly and appears in Cairo market in April. Coming at a time when no other melon fruits are available, it forms an important and popular food among the natives. It is usually eaten raw with sugar.



In Egypt melons are grown largely on the light loam found on the islands and the banks of the Nile when the river is low. The following is the system of cultivation practised. Trenches running in a transverse direction to the prevailing wind are dug in the silt bordering the water. The trenches are made 20 cm. wide, 30 cm. deep, and 90 cm. apart. A layer of decayed pigeon manure is placed in the bottom of the trenches, which are then refilled with soil. Farmyard manure is used where pigeon dung is not available, but does not give such good results. The seed is soaked in water and germinated before sowing. It is then sown in holes about 40 cm. apart, and a row of maize-stalks fixed in the soil by the side of each trench, in such a manner that the maize leans over the young plants and protects them from the wind, while leaving them exposed to the sun. Where there is a danger of the plants being covered with drifting sand, low barriers are constructed around the plots. Four or five seeds are sown in each hole, but when the seedlings have attained three or four leaves they are thinned so as to leave one plant only. During the growth of the crop the soil is hoed to keep it moist and loose. When the fruit begins to appear, the maize-stalks are removed and a second trench is often dug parallel with and close to that in which the plants are growing. This is filled with manure and soil in the same way as the first, and forms an additional supply of food for the plants. The best fruit on each plant is allowed to remain, the others being removed when small. These small fruits are in the case of the 'Shammam' known as 'sirt,' and in the case of the 'agour' they are called 'hersh.' They are eaten in the same way as cucumbers, but are in much greater demand and bring better prices than the latter. The 'Shammam' is grown almost always as a river crop. As the roots descend 60 cm. to 70 cm. into the soil, the water-level is sufficiently near the surface to enable the plants to grow without irrigation. The 'qaoon Santaouy' on the other hand, is cultivated chiefly on the high sandy lands on the edge of the desert, in which situations it is of course necessary to water the plants. The preparation of the ground, however, is the same. The 'agour' requires a more compact soil than the melons, and is therefore grown chiefly on basin lands which have been flooded during the previous autumn. In this case the seed is sown on the edge of a shallow furrow, and the manure applied when the seedlings have four or five leaves. Water melons are cultivated in the same way as sweet melons. They can, however, be grown on much poorer ground than the 'Shammam' and in situations where the sand is too loose for the 'Santaouy.'

The water melon is a very important crop, and is sown in large areas both on the river banks and inland. The number of varieties of red-fleshed water melons is large, but many of them are not well defined, intermediate forms making classification difficult. An attempt to do something in this respect was made last year by the Horticultural Society, by collecting and comparing fruits from various parts of the country. It was, however, found that it would be necessary to cultivate all the varieties together on the same soil for one or more years, in order to arrive at definite conclusions. The most distinct varieties are (1) the 'beledi,' a rather large, light green or grey fruit of medium quality, (2) the 'saidi,' which is dark green and has a firm, sweet flesh, and (3) the

'Yaffaoui,' which is a plain light-green fruit with a red flesh of excellent flavour. Almost all the varieties have oblong forms in addition to the ordinary shapes. These elongated forms are distinguished by the name of 'nims' (ichneumon) and are spoken of as 'beledi nims,' 'saidi nims,' &c. Of yellow-fleshed water melons, two distinct varieties are cultivated, viz. the 'hegazy' and the 'Stambouly.' The latter is somewhat rare. Both are thin-skinned fruits of excellent flavour. The 'abou-hazam' is a variety in which the flesh is rose-coloured in the centre and yellow next the skin. A white-fleshed water melon exists in Upper Egypt, but I have not seen this.

The cucumbers constitute another crop of importance in Egypt. Of the ordinary cucumber (*Cucumis sativus*) only one variety is grown. It is a strong-growing plant, with fruits about 25 cm. long at maturity. They are, however, always gathered when small, and in this state the flesh is crisp and of excellent flavour. In Arabic this cucumber is known as 'khiyar.' The snake cucumber (*C. flexuosus*, L.), although not of the same importance as the common cucumber, is, however, grown on a large scale. In habit of growth and general appearance it resembles a melon plant. It produces cylindrical twisted fruits about 50 cm. long. They are light blotched with dark green, and covered with soft woolly hairs. This is the 'fakus' of the Arabs. It is not gathered until it has attained a large size, when it is consumed as a salad chiefly by the natives. The hairy cucumber (*C. pubescens*, Willd.) is another plant which resembles the melon, but the leaves are covered with short prickly hairs. It is known as 'quattah firany' in Arabic. The fruits are cylindrical, generally straight, and about 25 cm. long when full grown. The skin is white, light green, or dark and light green mottled. It is covered with soft hairs and often striated with depressed lines. The fruits are gathered when small and eaten as a salad, or stuffed with meat and rice and afterwards cooked.

Of the genus *Cucurbita* the most important plants in Egypt are the vegetable marrows. These are in the market at almost all times of the year. The varieties most commonly grown are (1) a green bush marrow known as 'cosa Skandarani' and (2) a running variety with white fruit known as 'cosa beda.' As in the case of cucumbers, the fruits of vegetable marrows are always gathered when quite small. Apart from the vegetable marrows, the only plant belonging to *Cucurbita* *Pepo* cultivated by the fellaheen is a large globular pumpkin called 'qara magreby.' The fruit attains a diameter of about 35 cm., and a weight of 10 kilos. The flesh is white, and when cooked with rice and meat forms an agreeable dish.

This plant, however, is not so common as the Naples Gourd or 'qara Stambouly' (*C. moschata*), which is grown in all situations, with or without irrigation. The flesh is somewhat dry, of a pale orange colour, rather sweet when ripe, and slightly scented. As the fruit keeps in good condition for six months or more it is in use at all seasons. In addition to the ordinary variety, which has an elongated fruit constricted in the centre, a form with globular fruits is sometimes met with.

The mammoth pumpkins—*C. maxima*—are grown to a very small extent in Egypt. That most frequently seen is somewhat oval in shape,



with an average circumference of 1.25 m., and an average weight of 17-20 kilos. In the Cairo market it is known as 'qara Soudani,' but this is evidently a misnomer. The retail price varies between 4s. and 6s. each.

The plants which now remain to be mentioned are the luffa, or sponge gourd, and the calabash. Although luffas are not exported to a great extent from Egypt, large quantities are used in the country for washing cooking-utensils, &c. They are grown everywhere—on fences, trees, out-houses, &c., but there is a ready sale for all produced. The ripe unprepared fruits bring from 10s. to 16s. per hundred. Three varieties, all belonging to *Luffa aegyptiaca*, are grown. These differ chiefly in the length and thickness of the fruit. The 'rumi tawil,' which is the kind most valued, produces fruits 45-50 cm. long.

The fruits of the calabash—*Lagenaria vulgaris*—assume many different forms. Some are used as receptacles for water, while others are used as floats for fishing-nets and as household ornaments. The only variety which is of any value as a food plant is that known as 'qara atraj.' This has a straight cylindrical fruit, one metre or more long, with a light green skin and greenish pulp. Gathered in a green state, they are eaten cooked, or they may be allowed to ripen and be made into jam.

The cultivation and marketing of the Cucurbitaceous crops give employment to large numbers of people. Donkeys laden with cucumbers and vegetable marrows may be seen coming into Cairo any morning during nine months of the year. Sweet and water melons are chiefly collected in boats and brought to Cairo by river. These cargos are mostly discharged at Giza, whence they are taken by camels, donkeys, and conveyances of every kind to the market, shops, &c. The unloading of the boats in the early morning forms one of the busiest and most picturesque scenes in Egypt. Large numbers of water-melons and 'agours' are also brought direct from the fields to Cairo by camels.

The returns from an acre of melons or water melons vary between £20 and £40. As the expenses do not exceed £10, good profits are made by the cultivators. In view of this fact and of the large quantities of fruit grown, it is somewhat surprising that Egypt imports melons and water melons to the value of £66,000. In spite of the enormous consumption, however, there is no doubt that Egypt could quite easily supply her own wants. The principal reason why she does not do so at present is that the number of people who understand the cultivation is limited. The fellah is very conservative, and unless he has been taught to grow melons by his father or other relation, he is not likely to commence later in life.

Experiments carried out on a large scale have also shown that an extensive and highly lucrative export trade may be established in long cucumbers and melons with Europe in late autumn. For the development of this part of the industry, however, it will be necessary to look to European enterprise.

## THE LILY OF THE VALLEY.

By Miss H. C. PHILBRICK, F.R.H.S.

"Awake, O north wind; and come, thou south; blow upon my garden that its spices may flow forth."

*Convallaria majalis*—the Lily of the Valley. What a host of memories its very name conjures up! And we are carried away captive, for none can remember the time when he did not know and love this flower of fragrance; its beauty and its purity are all its own. Most of us are probably much more familiar with the Lily of the Valley as a garden flower than as a wild plant, but it is a true native nevertheless, and may in many places be found in abundance. You will bear in mind that it really is a plant of the woods, so that it is only there, or in sheltered coppices, that there is any reasonable hope of finding it. We may here, however, advantageously point out that in foliage and general effect the broad-leaved garlic is very similar to the Lily of the Valley (save in perfume), and both are found in the same situation at the same period of the year and that more than one of our friends have been previously disappointed by confounding the two. Yet I think we shall all agree that the pure white clustering starry blossoms of the garlic are very beautiful in themselves, and have a full claim to be admired for what they are—not scouted for what they fail to be.

Londoners will hear with interest that in the time of the great botanist Ray, the Lily of the Valley grew abundantly on Hampstead Heath.

In 1590, in St. Leonard's Forest near Horsham in Sussex, where the Lily of the Valley used to be seen in profusion, the local legend tells us that the patron saint of the district, St. Leonard, waged a mortal combat for many hours with a great and terrible dragon. Though in the end victorious, the saintly dragon-slayer by no means escaped scatheless, and these large masses of snowy blossoms scattered over the forest sprang from his blood shed during the dread encounter. Anyone who in this sceptical age has doubts can go and see the flowers for himself. In the east of England, the Lily of the Valley has made a dwelling place in both Essex and the sister county Suffolk, notably in Woodham Mortimer, the High Woods near Colchester, and in Bentley Woods near Ipswich. It is also common in many other English counties, very local or almost wanting in others, while in Ireland and Scotland it would appear to be scarcely indigenous, though it is indigenous in most parts of Europe from Italy to Lapland. In the woods of Eileriedle, in the neighbourhood of Hanover, the ground is covered with them; these woods are visited every Whit Monday, we are told, by numerous parties from Hanover, who gather these delightful May flowers.

It is sometimes called the May lily—many of the old names of plants, as the pasque flower, Lent lily, St John's wort, and numerous



others, having reference to the date of flowering. It is in France the "Muguet de Mai"; in Germany the "Maiblume." Its specific name, *majalis* or *maialis*, signifies "that which belongs to May," hence the old astrological books place the plant under the dominion of Mercury, for Maia, the daughter of Atlas, was the mother of Mercury or Hermes. It is also called Convall Lily and Lily Constancy by the old herbalists, and in some parts of the country its local name is "Ladder to Heaven." Its spotless purity of colour and lowly humility were probably the cause of the bestowal of the last name—a name that has no doubt descended from mediæval times. The old monkish herbalists often based their nomenclature on associations of a religious character, and united their plant names with the legends of the saints or the services of the Church's calendar.

"To the curious eye

A little monitor presents her page  
Of choice instruction; with her snowy bells,  
The Lily of the Vale. She not affects  
The public walk, nor gaze of noonday sun;  
She to no state or dignity aspires  
But, silent and alone, puts on her suit,  
And sheds her lasting perfume, but for which  
We had not known there was a thing so sweet  
Hid in the gloomy shade."—HURDIS.

Again—

"And their breath was mixed with fresh odours sent  
From the turf like the voice of an instrument."

As an ornamental plant few of our native species have a greater claim to a place in the garden, and may I say in our hearts, for few others can boast of so rich a fragrance or so delicate a beauty; added to these charms it is most easy of cultivation, requiring only to be placed in a shaded corner. The generic name *Convallaria* is from the Latin word for valley, and is bestowed in obvious reference to the sheltered woodland dells in which the Convall Lily finds a congenial home. The root of the Lily of the Valley is fibrous and perennial, extending a little below the surface of the ground, and reaching to a considerable distance. The leaves grow in pairs, their stalks sheathing one within the other. One of these leaves is often larger than the other, as all know, and also that they are very simple in form and deeply ribbed; when forced the leaves are of a much paler green and finer texture, and they take a deeper and more sombre green out of doors as the season advances. The flower stalk springs from the root and is about equal in length to the leaves. It bears a loose raceme of drooping bell-shaped flowers of pure white; hence in Beaumont and Fletcher's sonnet on the spring we find them referred to as "lilies whiter than the snow." In its wild state the blossoms are rarely succeeded by the fruit, but it produces it readily under cultivation. The fruit is rather a large berry, something in size between a fine black currant and a small cherry, and of a brilliant orange red. Our friends in the Antipodes are sighing for the lily fair, and have, I have recently been told, tried more than once to get the plants from England; but they will not, as our friends north of the Tweed have it, "carry," and ere they

arrive they are dead. The only resource left is to send out the seed, and this I am doing.

It is hardly necessary to say much upon the mode of cultivating this universal favourite: it delights in moisture and partial shade, and in a good light soil it loves to penetrate its fibrous roots. It is found in mountain copses sheltered by shrubs, and in the forest under trees. It is well to have a plantation of Lilies of the Valley upon a southern aspect if you want the flowers early, and in succession, for by this means they may be gathered a fortnight or three weeks earlier than otherwise—I am of course dealing with the days before retarded lilies were known—give rotten manure as surface dressings and plenty of moisture during active growth. The chief point to guard against in outdoor cultivation is frost, this being destructive to the blooms which appear with the leaves. A few spruce or other evergreen branches placed sparsely over the beds afford efficient protection, and a beneficial shelter encouraging growth. Preference should be given to a soft loamy soil well enriched with rotten manure, though sometimes fine lilies may be grown in rather heavy loam. In preparing soft loam it will be best to give a liberal admixture of leaf soil and sharp sand. Whatever the soil may happen to be it should be moderately firm before planting. The best time for planting is in the early autumn, as soon after the foliage has decayed, selecting the crowns singly and dividing them for beds likely to remain undisturbed for several years. The crowns may be planted two, or even three inches apart, as they do not become crowded so soon as to require thinning out. It is a good plan to cover the surface after planting with one or two inches of rotten manure, thorough maturity being secured only by constant applications of water, weak manure-water being the most efficacious. Treated thus with annual dressings of manure the beds will continue in good “heart” for years, and bear fine blossoms in abundance. When the plants become crowded with shoots they should be thinned out, or, better still, lifted and replanted, for weakly or blind crowns tend to retard vigorous growth. The Lily of the Valley is now largely forced into flower early, the roots being often imported from the Continent, where they are grown and prepared for the purpose. It may be naturalized, too, in any place sufficiently shaded and moist, and it soon spreads into broad masses. There is a variety with foliage striped with gold and another with double flowers, but the latter is not pretty. The finest form is called “Fortins,” which is much more robust than the common kind, having larger flowers; but in spite of this I think the smaller and familiar Lily of the Valley we found in the woods in our childhood is the one which lies the closest to our affections.

The Lily of the Valley possesses a most beautiful curve, added to its many other charms, which makes it so perfect as a decorative flower, and when associated with blue forget-me-not—*Myosotis palustris*, found growing by river banks, streams, and ditches in June, July, and August—the combination is delightful—the harmony is perfect. I would suggest that the lilies be arranged at the top of a glass vase, the forget-me-not at the base. Such vases are easy to get, and clear glass (not coloured) lends itself best, I think, to this arrangement, coming nearer to nature, and so nearer to the beautiful and the true.



## CHINESE PÆONIES.

By Rev. W. WILKS, M.A.

THE Pæony found so very commonly in gardens is *Paeonia officinalis*. It has three well known double varieties—one a deep blood-crimson, another dark rose fading paler, and one *called* white which opens a pale rose-pink and gradually fades to a dingy, transparent white; it is often known as ‘Adelaide.’ Of these the first-mentioned is by far the best. All three are comparatively common and have a distinctly unpleasant smell, reminding one a little of crushed ‘ladybirds.’

Why, then, are the Chinese Pæonies so much less often met with? Is it that people do not know of them—do not know how many varieties there are, and of what lovely colours and glorious form and pleasant scent? for most of them surpass the modern rose in fragrance. Or is it more probable that people in this twentieth century are in such an impatient hurry that they will not give the Chinese Pæony the time it needs to establish itself and grow into the marvellously beautiful plant it will become in four to five years from planting? Their cultivation is of the very easiest. They should be planted, only just below the surface, in the last week in October or the first in November, in ground that has been double-trenched, as they love to send down their thick, fleshy, tuberous roots deep into the soil. Plenty of good rotten dung should be dug in in the trenching, as, like roses, the soil can hardly be too rich for them. They want abundance of room and light and air and moisture (but not undrained wetness), but if sheltered from the prevailing wind the less will the blossoms suffer. If grown, as they deserve to be, in beds, they should have a top dressing of old rotten dung put on at the end of February, and if in at all a dry position they should have plenty of water, with a little chemical manure from the end of May till blooming time is over. To have fine flowers the very weak shoots should be removed at an early stage of their growth; and later on the side-blossom buds should be removed from the strong shoots that have been left, as soon as they are negotiable. A well-grown plant will require three or four short stakes on the outside of the clump, with encircling tar twine, to prevent the heavy blooms bringing the whole plant to the ground.

Among the very best varieties are—

‘Canari,’ white with a faint tinge of yellow.

‘Charles Binder,’ and ‘Ceres,’ very similar with pink guard petals and yellow and white centre.

‘Duchesse de Nemours,’ the best white with ivory centre. It is often sold under the name of ‘Whitleyi.’

‘Alba Superba,’ the largest of all, loosely double and worthy of all the superlatives imaginable. (Fig. 12.)

‘Triomphe de l’Exposition de Lille,’ silver-pink with yellow stamens, loosely double.

- 'Solfaterre,' good early white tinged with yellow.
- 'Madame Callot,' pale flesh, very large and very double.
- 'Philomèle,' bright pink guard petals with a yellow centre.
- 'Reine des Français,' pale pink guard petals with white and pink centre very beautiful.
- 'Belle Châtelaine,' a very fine pale pink.
- 'Miss Salway,' ivory yellow.
- 'Festiva Maxima,' paper white with crimson splashes.
- 'Monsieur Rousselon,' loose blush white with prominent yellow stamens.
- 'Princess Beatrice,' bright pink guard petals with ivory and pink centre, somewhat like 'Reine des Français.'
- 'Princess Nicholas Ribere' or 'Ribesco' (it goes under both names), silver pink guard petals, ivory yellow and pink centre.
- 'Alba Maxima,' another good white.
- 'Princess Patricia,' blush guard petals with ivory centre.
- 'Lady Leonora Bramwell.' For those who like a pink that seems as if it had a tinge of blue in it this is a very fine plant; very free-blooming, strongly rose-scented.
- 'Marquise de Lorne,' silver pink with yellow stamens.
- 'Marie Jaquin,' exactly like a white water lily, very beautiful.
- 'Vanderbilt,' pink guard petals, yellow centre.
- 'Frances' and 'Alexandrina,' two good pinks.

But perhaps this list is too long. If so take—

- 'Alba Superba' 'Duchesse de Nemours' and 'Festiva Maxima,' three very fine but quite distinct whites.
- 'Reine des Français' and 'Philomèle,' both indispensable.
- 'Belle Châtelaine,' 'Frances,' and 'Marquise de Lorne,' three distinct shades of pink.

Add to them 'Princess Nicholas Ribere' (or 'Ribesco') and 'Marie Jaquin,' and you have ten of the best. But a really great difficulty is to get them true to name. For instance, a worthless pink has done duty before now for the glorious white 'Duchesse de Nemours' which is sometimes labelled 'Double Whitley.' 'Reine des Français' and 'Philomèle' are also sent out under misleading English names, and now that intercourse with the Continent is so easy and so frequent the practice of rechristening foreign-raised plants by English importers cannot be too strongly condemned. The figures are from photographs taken in the garden at Coombe House, where these wonderful plants are grown to the utmost perfection, and where they have stood undisturbed for eleven years, giving an equally magnificent display annually since the third year from planting.





FIG. 12.—CHINESE PEONY 'ALBA SUPERBA.'

[To face p. 40.



FIG. 13.—CHINESE PÆONIES AT COOMBE HOUSE, CROYDON.

[To face p. 41.



## REPORT ON THE METEOROLOGICAL OBSERVATIONS MADE AT THE SOCIETY'S GARDEN AT WISLEY IN 1908.

By MR. R. H. CURTIS, F.R. Met. Soc.

THE meteorological record at the Society's Garden at Wisley has been maintained without break throughout the year, and that the observers, Messrs. Frazer and Wallis, have taken a keen interest in their work is shown by the careful way in which the record has been kept. The instruments were examined and compared with standard instruments in July, and the station was then found to be in excellent order.

The weather of 1908 was in no respect very exceptional. The temperature was on the whole about the average, there were some warm spells in June and July when several times  $80^{\circ}$  was exceeded, and again at the close of September and beginning of October when the minimum remained above  $60^{\circ}$ . Bright sunshine was more abundant than usual over the southern half of England, and rather less than the average elsewhere. Rainfall was about the average in Scotland and Ireland, about 5 per cent. less than average in Wales, 10 per cent. less in North England, and 14 per cent. less over the southern half of England. Gales were not numerous, thunderstorms also were less frequent than usual, but there were some severe snowstorms, the melting of the snow causing floods in some districts.

The observations for each month are as follows:

*January.*—The weather of the first half of the month was in somewhat marked contrast to that of the latter half, the former being on the whole fair and cold, whilst during the last two weeks it was generally dull, and for the season rather mild, but with an unusual amount of fog. The average temperature for the month was in most places somewhat below the normal, and during the first week some low minima were recorded, the screened thermometer at the Garden falling to  $15^{\circ}7$ , which was the lowest point reached until the last day but one of the year. Over the greater part of England the fall of rain was considerably below the average, and in some districts it did not amount to an inch for the entire month. At Wisley the total was just over an inch and an half, but of this amount an inch and a quarter fell on one day (7th), the remainder being distributed over nine other days. In some parts of the kingdom, however, there were very heavy falls, and upwards of an inch fell in twenty-four hours at several places. The winds experienced were pretty evenly distributed round the compass except for the quadrant from east to south, from which they seldom blew. Bright sunshine was generally well above the average, and at some stations in the south of England it amounted to 40 per cent. of the possible amount; at the gardens daily amounts of six hours and upwards were registered on five occasions.

## Observations made at Wisley :

|                                                                                                                                                      |     |              |     |       |                   |                     |
|------------------------------------------------------------------------------------------------------------------------------------------------------|-----|--------------|-----|-------|-------------------|---------------------|
| Mean temperature of the air in shade                                                                                                                 | ... | ...          | ... | 36°·3 |                   |                     |
| Highest                                                                                                                                              | "   | "            | "   | ...   | 53°·5             | on the 27th         |
| Lowest                                                                                                                                               | "   | "            | "   | ...   | 15°·7             | " 6th               |
| Lowest                                                                                                                                               | "   | on the grass | ... | ...   | 9°·2              | " 4th and 12th      |
|                                                                                                                                                      |     |              |     |       | At 1 ft.<br>deep. | At 2 ft.<br>deep.   |
| Mean temperature of the soil at 9 a.m.                                                                                                               | ... | ...          | ... | 36°·9 | 39°·3             | 41°·9               |
| Highest                                                                                                                                              | "   | "            | "   | ...   | 41°·7             | 41°·8               |
| Lowest                                                                                                                                               | "   | "            | "   | ...   | 33°·9             | 37°·0               |
| Mean relative humidity of the air at 9 a.m. (complete saturation being represented by 100)                                                           | ... | ...          | ... | ...   | ...               | 92%                 |
| Rain fell on 10 days to the total depth of                                                                                                           | ... | ...          | ... | ...   | ...               | 1·55 in.            |
| (Equivalent to about 7½ gallons of water to the square yard.)                                                                                        |     |              |     |       |                   |                     |
| Heaviest fall on any day                                                                                                                             | ... | ...          | ... | ...   | ...               | 1·26 in. on the 7th |
| The prevailing winds were from between south and west.                                                                                               |     |              |     |       |                   |                     |
| The average velocity of the wind was 7½ miles an hour.                                                                                               |     |              |     |       |                   |                     |
| There were 58 hours of bright sunshine, equal to 23 per cent. of the greatest possible amount. There were 13 days on which no sunshine was recorded. |     |              |     |       |                   |                     |

*February.*—The weather of February was marked by a persistence of westerly winds, which during the latter half of the month frequently attained considerable strength, and were accompanied by a good deal of wet weather. It was, however, warmer than February usually is, but whilst there were no very severe frosts neither were there any very warm days, so that there was but a moderate range of temperature. The coldest period occurred at the close of the second week, when the screened thermometer in the gardens fell to 22°, but at the close of the month a keen cold wind with squalls of rain, and in many places of hail and snow, occasioned a spell of weather which, although not so cold, was perhaps more generally disagreeable. The rainfall was below the average over the southern half of the kingdom, but rather above it in the north. At Wisley the fall, which was spread over fifteen days, only amounted to 0·85 inch, and in many districts it was less than an inch. The distribution of bright sunshine was peculiar, since the largest amounts were recorded over the north-eastern districts and the smallest in the west. At Wisley the total duration was eighty hours, and at many places in the west, which usually have the largest amounts, less than 50 hours were registered, whilst in Northumberland and on the east coast of Scotland the total ranged from 100 to 111 hours.

## Observations made at Wisley :

|                                                                                            |     |              |     |       |                   |                       |
|--------------------------------------------------------------------------------------------|-----|--------------|-----|-------|-------------------|-----------------------|
| Mean temperature of the air in shade                                                       | ... | ...          | ... | ...   | 41°·5             |                       |
| Highest                                                                                    | "   | "            | "   | ...   | 53°·8             | on the 17th           |
| Lowest                                                                                     | "   | "            | "   | ...   | 22°·0             | " 13th                |
| Lowest                                                                                     | "   | on the grass | ... | ...   | 21°·4             | " 13th                |
|                                                                                            |     |              |     |       | At 1 ft.<br>deep. | At 2 ft.<br>deep.     |
| Mean temperature of the soil at 9 a.m.                                                     | ... | ...          | ... | 39°·6 | 41°·3             | 42°·2                 |
| Highest                                                                                    | "   | "            | "   | ...   | 43°·1             | 43°·2                 |
| Lowest                                                                                     | "   | "            | "   | ...   | 36°·1             | 39°·1                 |
| Mean relative humidity of the air at 9 a.m. (complete saturation being represented by 100) | ... | ...          | ... | ...   | ...               | 88%                   |
| Rain fell on 15 days to the total depth of                                                 | ... | ...          | ... | ...   | ...               | 0·85 in.              |
| (Equivalent to about 4 gallons of water to the square yard.)                               |     |              |     |       |                   |                       |
| Heaviest fall on any day                                                                   | ... | ...          | ... | ...   | ...               | 0·21 in. on the 16th. |



The prevailing winds were from south-west and west.

The average velocity of the wind was  $8\frac{1}{2}$  miles an hour.

There were 80 hours of bright sunshine, equal to 28 per cent. of the greatest possible amount. There were 4 days on which no sunshine was recorded.

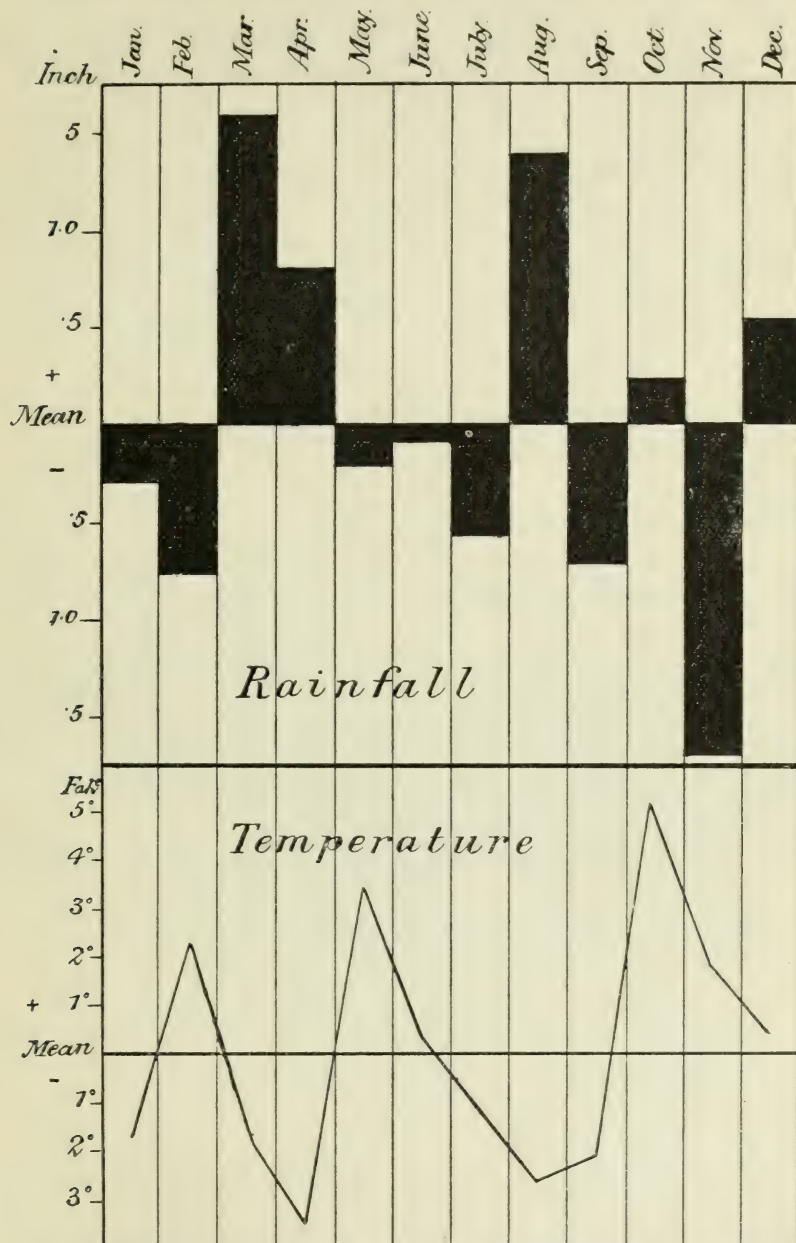


FIG. 14.—DIFFERENCE OF MEAN TEMPERATURE AND OF RAINFALL FOR EACH MONTH FROM THE AVERAGE.

March was a month of continuously unsettled weather, accompanied by winds from nearly every point of the compass, although those from

westerly points predominated. The temperature was very generally below the normal, whilst the rainfall was everywhere in excess, and hail and snow were not infrequent. The amount of bright sunshine was with few exceptions less than the average, and the weather of the month may be summed up as cold, wet, and windy, and generally unfavourable for all farm and garden work. Occasionally sharp frosts were experienced, and on the night of the 15th the screened thermometer at Wisley fell to  $23^{\circ}\cdot3$ , and the thermometer exposed upon the grass to  $16^{\circ}\cdot8$ , whilst another grass thermometer exposed in a lower part of the garden fell a degree and a half lower. But throughout the month there was an absence of really warm days, the highest temperature reached being only  $56^{\circ}\cdot3$  on the 24th, when a westerly wind blew and the sun shone brightly throughout the greater part of the day. It was to this absence of spring-like warmth rather than to the occasional occurrence of somewhat low temperatures that the low average temperature and the general backwardness of vegetation were due, the month being one of the coldest Marches on record.

Observations made at Wisley:

|                                                                                                                                                          |     |              |     |     |                    |                    |                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|-----|--------------|-----|-----|--------------------|--------------------|--------------------|
| Mean temperature of the air in shade                                                                                                                     | ... | ...          | ... | ... | 40 <sup>o</sup> ·2 |                    |                    |
| Highest                                                                                                                                                  | "   | "            | "   | ... | ...                | 56 <sup>o</sup> ·3 | on the 24th        |
| Lowest                                                                                                                                                   | "   | "            | "   | ... | ...                | 23 <sup>o</sup> ·3 | " 15th             |
| Lowest                                                                                                                                                   | "   | on the grass | ... | ... | ...                | 16 <sup>o</sup> ·8 | " 15th             |
|                                                                                                                                                          |     |              |     |     | At 1 ft. deep.     | At 2 ft. deep.     | At 4 ft. deep.     |
| Mean temperature of the soil at 9 a.m.                                                                                                                   | ... | ...          | ... | ... | 40 <sup>o</sup> ·2 | 41 <sup>o</sup> ·9 | 42 <sup>o</sup> ·4 |
| Highest                                                                                                                                                  | "   | "            | "   | ... | ...                | 44 <sup>o</sup> ·2 | 43 <sup>o</sup> ·3 |
| Lowest                                                                                                                                                   | "   | "            | "   | ... | ...                | 37 <sup>o</sup> ·6 | 41 <sup>o</sup> ·9 |
| Mean relative humidity of the air at 9 a.m. (complete saturation being represented by 100)                                                               | ... | ...          | ... | ... | ...                | ...                | 85%                |
| Rain fell on 20 days to the total depth of                                                                                                               | ... | ...          | ... | ... | ...                | ...                | 3·06 in.           |
| (Equivalent to nearly 14½ gallons of water to the square yard.)                                                                                          |     |              |     |     |                    |                    |                    |
| Heaviest fall on any day                                                                                                                                 | ... | ...          | ... | ... | ...                | 0·54 in.           | on the 5th         |
| The prevailing winds were from between south and north-west.                                                                                             |     |              |     |     |                    |                    |                    |
| The average velocity of the wind was 7½ miles an hour.                                                                                                   |     |              |     |     |                    |                    |                    |
| There were 111 hours of bright sunshine, equal to 30 per cent. of the greatest possible amount. There were but 3 days on which no sunshine was recorded. |     |              |     |     |                    |                    |                    |

*April.*—The weather of April was in some respects very remarkable, the persistent cold winds from northerly quarters keeping the temperature so low that the month ranks as the coldest April experienced for nearly forty years. The coldest snap was on the 8th and 9th, when the un-screened thermometer at the gardens fell to  $17^{\circ}$ ; but from the 13th to the 15th, and again from the 18th to the 25th, although the cold was less severe, the thermometer on the grass fell several degrees below the freezing point nearly every night. In some parts of the kingdom, however, the low readings at Wisley were greatly surpassed, a temperature of  $4^{\circ}$  having been obtained on the ground at Balmoral,  $9^{\circ}$  at Huddersfield, and less than  $15^{\circ}$  at many places. During the last ten days of the month there were frequent snowstorms, the worst occurring on the 25th with a severe gale, the snow falling to such a depth that railway traffic became disorganized, road traffic was completely stopped in many districts, and much damage was done to trees and shrubs. The rainfall over the greater part of England and Ireland was above the average, but in



Scotland it was rather below it. Bright sunshine varied from about 100 hours on the eastern coast to rather less than 200 hours in the south-west; at Wisley 145 hours were registered, or 35 per cent. of the greatest amount possible.

Observations made at Wisley :

|                                                                                                                                                      |     |              |     |                |                |                      |
|------------------------------------------------------------------------------------------------------------------------------------------------------|-----|--------------|-----|----------------|----------------|----------------------|
| Mean temperature of the air in shade                                                                                                                 | ... | ...          | ... | ...            | 44°·0          |                      |
| Highest                                                                                                                                              | "   | "            | "   | ...            | 62°·7          | on the 29th          |
| Lowest                                                                                                                                               | "   | "            | "   | ...            | 27°·2          | " 9th                |
| Lowest                                                                                                                                               | "   | on the grass | ... | ...            | 17°·0          | " 9th                |
|                                                                                                                                                      |     |              |     | At 1 ft. deep. | At 2 ft. deep. | At 4 ft. deep.       |
| Mean temperature of the soil at 9 a.m.                                                                                                               | ... | ...          | ... | 43°·8          | 45°·0          | 44°·5                |
| Highest                                                                                                                                              | "   | "            | "   | ...            | 49°·4          | 47°·3                |
| Lowest                                                                                                                                               | "   | "            | "   | ...            | 40°·1          | 43°·4                |
| Mean relative humidity of the air at 9 a.m. (complete saturation being represented by 100)                                                           | ... | ...          | ... | ...            | ...            | 78%                  |
| Rain fell on 14 days to the total depth of                                                                                                           | ... | ...          | ... | ...            | ...            | 2·48 in.             |
| (Equivalent to nearly 11½ gallons of water to the square yard.)                                                                                      |     |              |     |                |                |                      |
| Heaviest fall on any day                                                                                                                             | ... | ...          | ... | ...            | ...            | 0·65 in. on the 25th |
| The prevailing winds were from north and north-east.                                                                                                 |     |              |     |                |                |                      |
| The average velocity of the wind was 7½ miles an hour.                                                                                               |     |              |     |                |                |                      |
| There were 145 hours of bright sunshine, equal to 35 per cent. of the greatest possible amount. There were 4 days on which no sunshine was recorded. |     |              |     |                |                |                      |

*May.*—A feature of the weather of this month of interest to gardeners was the absence of low night temperatures, the mean of the minimum temperatures being generally a good deal above the average, whilst in many places the lowest point reached by the thermometer was above the lowest which had been observed in May for a good many years past. This was largely due to the cloudiness of the sky, by which the radiation of heat from the ground was greatly checked whilst the temperature of the soil steadily increased, the readings of the thermometer at Wisley one foot below the surface being 16° higher at the end of May than at the beginning of April. The winds also were from southerly and westerly points; and although the amounts of sunshine registered were generally rather under the average the deficit was not large, and in many places between 40 per cent. and 50 per cent. of the possible total was recorded. Thunderstorms with heavy falls of rain or hail were not infrequent, but generally speaking the precipitation was below the average for the month.

Observations made at Wisley :

|                                                                                            |     |              |     |                |                |                      |
|--------------------------------------------------------------------------------------------|-----|--------------|-----|----------------|----------------|----------------------|
| Mean temperature of the air in shade                                                       | ... | ...          | ... | ...            | 55°·9          |                      |
| Highest                                                                                    | "   | "            | "   | ...            | 75°·7          | on the 2nd           |
| Lowest                                                                                     | "   | "            | "   | ...            | 36°·5          | " 24th               |
| Lowest                                                                                     | "   | on the grass | ... | ...            | 30°·0          | " 11th               |
|                                                                                            |     |              |     | At 1 ft. deep. | At 2 ft. deep. | At 4 ft. deep.       |
| Mean temperature of the soil at 9 a.m.                                                     | ... | ...          | ... | 54°·4          | 53°·5          | 50°·0                |
| Highest                                                                                    | "   | "            | "   | ...            | 59°·0          | 57°·3                |
| Lowest                                                                                     | "   | "            | "   | ...            | 50°·1          | 48°·0                |
| Mean relative humidity of the air at 9 a.m. (complete saturation being represented by 100) | ... | ...          | ... | ...            | ...            | 77%                  |
| Rain fell on 14 days to the total depth of                                                 | ... | ...          | ... | ...            | ...            | 1·74 in.             |
| (Equivalent to about 8½ gallons of water to the square yard.)                              |     |              |     |                |                |                      |
| Heaviest fall on any day                                                                   | ... | ...          | ... | ...            | ...            | 0·29 in. on the 13th |

The prevailing winds were from between south and west.

The average velocity of the wind was 7 miles an hour.

There were 192 hours of bright sunshine, equal to 40 per cent. of the greatest possible amount. There were but 3 days on which no sunshine was recorded.

*June.*—The weather of June was generally fine, with a good deal of sunshine and less rain than the average. A cool northerly wind which was experienced about the 5th and 6th brought the temperature down somewhat, and there was some changeable weather towards the middle of the month, but this was followed by warm summer-like weather which lasted till the close. The amount of rain which fell was in most places less than the average, the amount recorded at Wisley being only 1·72 inches, of which 0·71 inch fell in one day, and it was only on six days that there was any rain to measure. The amount of bright sunshine was generally above the average, and exceeded 280 hours at several places in the south of England. A violent squall, which, however, was of very limited area, was experienced in the Thames valley in the course of the night of the 1st, and did a considerable amount of damage to small trees in Bushey Park and elsewhere; and another of somewhat similar character visited North Herts on the afternoon of the 4th, in thundery weather, and travelled in a S.S.E. direction for about six miles, scattering hayricks, overturning loaded carts, and levelling trees and other obstacles in its path. The temperature of the soil one foot below the surface increased during the month  $4\frac{1}{2}^{\circ}$ .

Observations made at Wisley:

|                                                                                                                                      |     |              |     |     |                |                |                     |
|--------------------------------------------------------------------------------------------------------------------------------------|-----|--------------|-----|-----|----------------|----------------|---------------------|
| Mean temperature of the air in shade                                                                                                 | ... | ...          | ... | ... | 59°·4          |                |                     |
| Highest                                                                                                                              | "   | "            | "   | ... | ...            | 80°·6          | on the 4th          |
| Lowest                                                                                                                               | "   | "            | "   | ... | ...            | 37°·2          | " 7th               |
| Lowest                                                                                                                               | "   | on the grass | ... | ... | ...            | 29°·1          | " 22nd              |
|                                                                                                                                      |     |              |     |     | At 1 ft. deep. | At 2 ft. deep. | At 4 ft. deep.      |
| Mean temperature of the soil at 9 a.m.                                                                                               | ... | ...          | ... | ... | 60°·6          | 60°·1          | 56°·3               |
| Highest                                                                                                                              | "   | "            | "   | ... | ...            | 63°·7          | 62°·1 58°·0         |
| Lowest                                                                                                                               | "   | "            | "   | ... | ...            | 58°·4          | 58°·2 53°·8         |
| Mean relative humidity of the air at 9 a.m. (complete saturation being represented by 100)                                           | ... | ...          | ... | ... | ...            | ...            | 71%                 |
| Rain fell on 6 days to the total depth of                                                                                            | ... | ...          | ... | ... | ...            | ...            | 1·72 in.            |
| (Equivalent to nearly $8\frac{1}{4}$ gallons of water to the square yard.)                                                           |     |              |     |     |                |                |                     |
| Heaviest fall on any day                                                                                                             | ... | ...          | ... | ... | ...            | ...            | 0·71 in. on the 1st |
| The prevailing winds were from north-east and north.                                                                                 |     |              |     |     |                |                |                     |
| The average velocity of the wind was 5 miles an hour.                                                                                |     |              |     |     |                |                |                     |
| There were 266 hours of bright sunshine, equal to 55 per cent. of the greatest possible amount. There were no entirely sunless days. |     |              |     |     |                |                |                     |

*July.*—The fine weather with which June closed continued during the opening days of July and produced some high readings of the thermometer over all the central parts of England and even in many parts of Scotland. After the first few days, however, a change took place to unsettled weather, a good many small depressions passing across the country bringing with them rain, which in some districts was very heavy and lowered the temperature considerably. The wet weather ceased about the 18th, and from that day to the close of the month no rain fell at Wisley. The fall of rain was, however, patchy, some districts having much less than the average, whilst others, as for example the north-west



of England, had considerably more. Winds blew chiefly from westerly points and at times rather strongly, and there were several thunderstorms. Bright sunshine was plentiful over southern England, but at some places in the north it was very deficient, not amounting to 20 per cent. of the possible amount. At Wisley 41 per cent. of the possible amount was

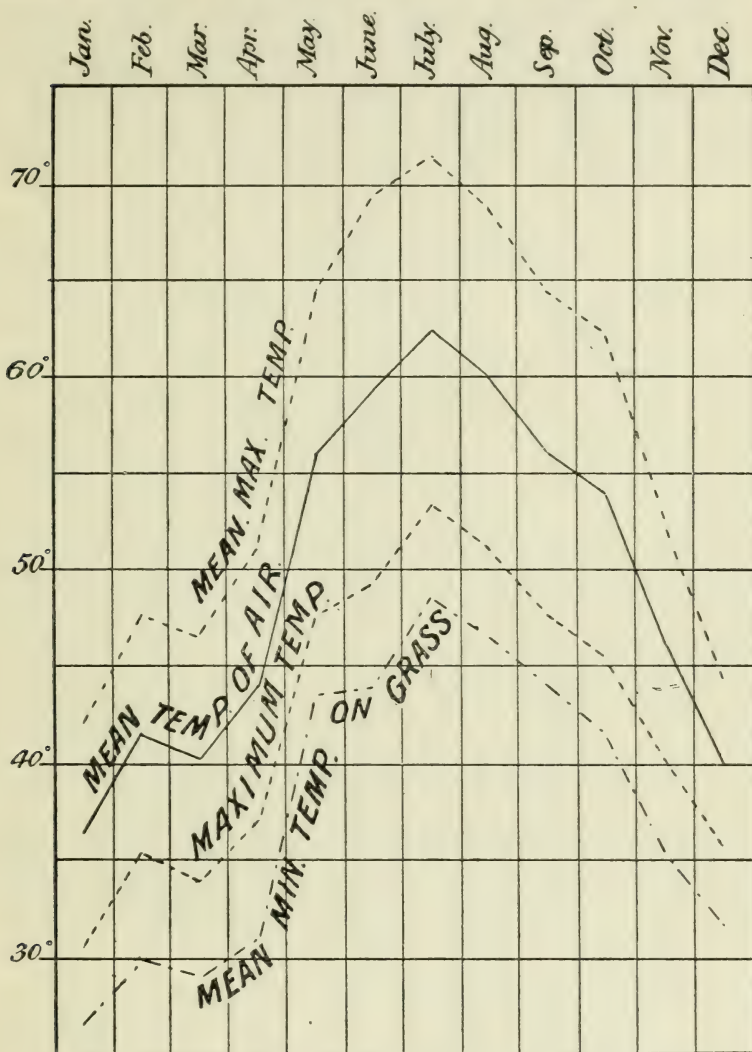


FIG. 15.—MEAN TEMPERATURE OF THE AIR; MAXIMUM AND MINIMUM TEMPERATURES OF THE AIR; AND MINIMUM TEMPERATURE ON THE GRASS, FOR EACH MONTH.

recorded, there having been no day on which some record was not obtained.

Observations made at Wisley :

|                                      |     |              |     |     |                  |
|--------------------------------------|-----|--------------|-----|-----|------------------|
| Mean temperature of the air in shade | ... | ...          | ... | ... | 62°·2            |
| Highest                              | "   | "            | "   | ... | 82°·6 on the 3rd |
| Lowest                               | "   | "            | "   | ... | 47°·0 " 30th     |
| Lowest                               | "   | on the grass | ... | ... | 38°·7 " 3rd      |

|                                                                                                                                      |     |     |     |     | At 1 ft.<br>deep. | At 2 ft.<br>deep. | At 4 ft.<br>deep. |
|--------------------------------------------------------------------------------------------------------------------------------------|-----|-----|-----|-----|-------------------|-------------------|-------------------|
| Mean temperature of the soil at 9 a.m.                                                                                               | ... | ... | ... | ... | 62°·8             | 62°·5             | 59°·3             |
| Highest                                                                                                                              | "   | "   | "   | ... | 65°·6             | 64°·2             | 60°·6             |
| Lowest                                                                                                                               | "   | "   | "   | ... | 58°·9             | 60°·1             | 58°·1             |
| Mean relative humidity of the air at 9 a.m. (complete saturation being represented by 100)                                           |     |     |     |     |                   |                   |                   |
|                                                                                                                                      | ... | ... | ... | ... | ...               | ...               | 75%               |
| Rain fell on 11 days to the total depth of                                                                                           | ... | ... | ... | ... | ...               | ...               | 1·85 in.          |
| (Equivalent to about 8½ gallons of water to the square yard.)                                                                        |     |     |     |     |                   |                   |                   |
| Heaviest fall on any day                                                                                                             | ... | ... | ... | ... | ...               | 0·59 in.          | on the 16th       |
| The prevailing winds were from south-west and west.                                                                                  |     |     |     |     |                   |                   |                   |
| The average velocity of the wind was 5 miles an hour.                                                                                |     |     |     |     |                   |                   |                   |
| There were 202 hours of bright sunshine, equal to 41 per cent. of the greatest possible amount. There were no entirely sunless days. |     |     |     |     |                   |                   |                   |

*August.*—The winds throughout a great part of this month were from west, north-west or north, and consequently cool, so that there was an entire absence of very hot days, although the weather was generally fine and dry. The nights were warm, except for a short interval in the middle of the month, when the grass thermometer fell to 35° at Wisley, and to below the freezing point at several places further north. After the third week the character of the weather entirely changed and a succession of disturbances passing across the kingdom brought with them unsettled, showery weather, and in some parts heavy rain. On the whole the month was a sunny one, Wisley having very nearly 50 per cent. of the possible amount, and many places on the south coast having upwards of 60 per cent. The frequency of rain varied a good deal in different localities, but whilst the fall was deficient over the northern half of the kingdom and in Ireland, it exceeded the average over the southern counties.

#### Observations made at Wisley:

| Mean temperature of the air in shade                                                                                                                     | ... | ...          | ... | ... | 59°·9             |                   |                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|-----|--------------|-----|-----|-------------------|-------------------|-------------------|
| Highest                                                                                                                                                  | "   | "            | "   | ... | ...               | 81°·2             | on the 3rd        |
| Lowest                                                                                                                                                   | "   | "            | "   | ... | ...               | 41°·0             | " 17th            |
| Lowest                                                                                                                                                   | "   | on the grass | ... | ... | ...               | 35°·0             | " 17th            |
|                                                                                                                                                          |     |              |     |     | At 1 ft.<br>deep. | At 2 ft.<br>deep. | At 4 ft.<br>deep. |
| Mean temperature of the soil at 9 a.m.                                                                                                                   | ... | ...          | ... | ... | 61°·8             | 62°·5             | 60°·7             |
| Highest                                                                                                                                                  | "   | "            | "   | ... | 66°·6             | 64°·7             | 61°·6             |
| Lowest                                                                                                                                                   | "   | "            | "   | ... | 57°·7             | 60°·0             | 59°·5             |
| Mean relative humidity of the air at 9 a.m. (complete saturation being represented by 100)                                                               |     |              |     |     |                   |                   |                   |
|                                                                                                                                                          | ... | ...          | ... | ... | ...               | ...               | 74½%              |
| Rain fell on 14 days to the total depth of                                                                                                               | ... | ...          | ... | ... | ...               | ...               | 3·18 in.          |
| (Equivalent to about 15 gallons of water to the square yard.)                                                                                            |     |              |     |     |                   |                   |                   |
| Heaviest fall on any day                                                                                                                                 | ... | ...          | ... | ... | ...               | 1·04 in.          | on the 23rd       |
| The prevailing winds were from between south-west and north.                                                                                             |     |              |     |     |                   |                   |                   |
| The average velocity of the wind was 6 miles an hour.                                                                                                    |     |              |     |     |                   |                   |                   |
| There were 215 hours of bright sunshine, equal to 48 per cent. of the greatest possible amount. There were but 2 days on which no sunshine was recorded. |     |              |     |     |                   |                   |                   |

*September.*—Generally speaking, the weather was unsettled and changeable all through the month, the temperature varying considerably, but being on the whole lower than the average until the close of the month, when a spell of warm summer-like weather set in. At the beginning of the month, with a cool northerly wind, the thermometer very generally failed to reach 55°, whilst at its close it rose to 77° at Wisley,



that being the highest reading recorded there for the month, and to upwards of  $80^{\circ}$  in some parts of the kingdom. In some places there were sharp ground-frosts also at the opening of the month, chiefly in the north and over central England, but at Wisley  $32^{\circ}$  was reached only on the night of the 12th. In Berkshire a heavy storm of rain, hail and snow was experienced on the 11th, and at Canterbury a deluge of hail and rain accompanied a thunderstorm on the same day. The rainfall was considerably more than the average in the north but was much below it in the south of England; the total fall at the Garden was 1.29 inches, whilst on the Essex coast it did not exceed an inch. Bright sunshine was deficient

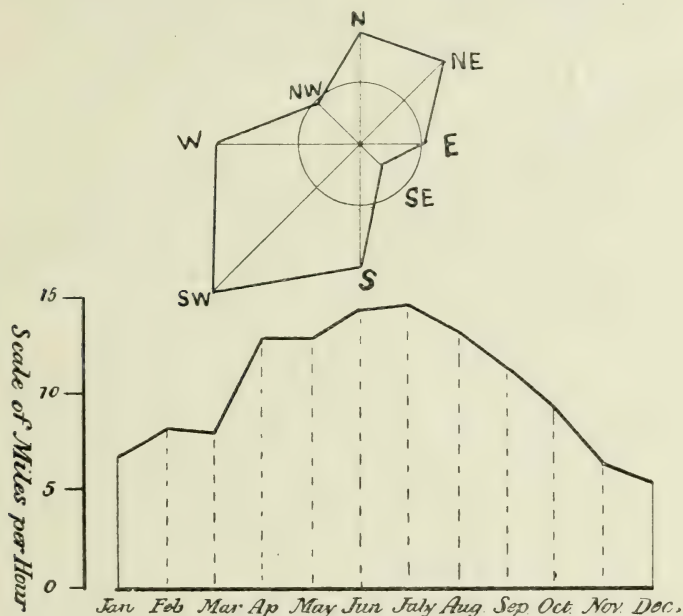


FIG. 16.

Upper diagram shows the annual distribution of winds round the compass. The prevalence of calms is indicated on the same scale by the diameter of the circle.

Lower diagram shows the mean velocity of the wind for each month of the year.

over the north but slightly in excess of the average on the south coast, and at Wisley it amounted to 41 per cent. of the possible amount.

Observations made at Wisley:

|                                                                                            |     |              |     |     |                |                |                   |
|--------------------------------------------------------------------------------------------|-----|--------------|-----|-----|----------------|----------------|-------------------|
| Mean temperature of the air in shade                                                       | ... | ...          | ... | ... | 56°.0          |                |                   |
| Highest                                                                                    | "   | "            | "   | ... | ...            | ...            | 77°.2 on the 30th |
| Lowest                                                                                     | "   | "            | "   | ... | ...            | ...            | 36°.3 " 13th      |
| Lowest                                                                                     | "   | on the grass | ... | ... | ...            | ...            | 32°.3 " 13th      |
|                                                                                            |     |              |     |     | At 1 ft. deep. | At 2 ft. deep. | At 4 ft. deep.    |
| Mean temperature of the soil at 9 a.m.                                                     | ... | ...          | ... | ... | 56°.3          | 57°.6          | 57°.4             |
| Highest                                                                                    | "   | "            | "   | ... | ...            | ...            | 59°.7             |
| Lowest                                                                                     | "   | "            | "   | ... | ...            | ...            | 53°.7             |
| Mean relative humidity of the air at 9 a.m. (complete saturation being represented by 100) | ... | ...          | ... | ... | ...            | ...            | 56°.3             |
|                                                                                            |     |              |     |     |                |                | 56°.6             |
|                                                                                            |     |              |     |     |                |                | 81%               |

Rain fell on 13 days to the total depth of ... .. 1.29 in.

(Equivalent to about 6 gallons of water to the square yard.)

Heaviest fall on any day ... .. 0.44 in. on the 3rd

The prevailing winds were from between south and west.

The average velocity of the wind was 5 miles an hour.

There were 153 hours of bright sunshine, equal to 41 per cent. of the greatest possible amount. There were only 2 days on which no sunshine was recorded.

*October.*—The remarkably warm weather with which September came to a close continued on into October, and the month was one of unusual mildness. During the first four days the thermometer rose to quite an exceptional height, the maximum readings being the highest recorded in October for nearly half a century. At the Garden 77° was the maximum, but at some stations in England 80° was exceeded, and a reading of 78° was recorded so far north as Banffshire. The third week, although not cold for the time of the year, was the coolest period of the month, and ground frosts occurred two or three times, but as the month drew to a close the thermometer rose again, and on the 29th a shade reading within 2° of 70° was obtained at Wisley. On the whole the month was the warmest October experienced for many years. The temperature of the soil kept high, as might have been expected from what has been already said, and the mean at one foot below the surface was only 2° below the mean for September. The fall of rain was generally below the average, and at many places a large part of the total fall fell in one day; at Wisley nearly half of the monthly amount fell on the 18th, and at many places in the south and south-west of England large falls of more than two inches were recorded at about the same date; at Weymouth four inches fell in about five hours. The winds were mostly from southerly points, and the amounts of "bright" sunshine registered were generally above the normal, the percentage of the possible sunshine amounting to nearly 50 per cent. at many places.

Observations made at Wisley :

|                                      |     |              |     |     |                  |
|--------------------------------------|-----|--------------|-----|-----|------------------|
| Mean temperature of the air in shade | ... | ...          | ... | ... | 53°.8            |
| Highest                              | "   | "            | "   | ... | 77°.0 on the 2nd |
| Lowest                               | "   | "            | "   | ... | 31°.4 " 25th     |
| Lowest                               | "   | on the grass | ... | ... | 26°.2 " 25th     |

|                                        |     |     |     |                   |                   |                   |
|----------------------------------------|-----|-----|-----|-------------------|-------------------|-------------------|
|                                        |     |     |     | At 1 ft.<br>deep. | At 2 ft.<br>deep. | At 4 ft.<br>deep. |
| Mean temperature of the soil at 9 a.m. | ... | ... | ... | 54°.3             | 55°.9             | 56°.3             |
| Highest                                | "   | "   | "   | ...               | 59°.3             | 59°.4             |
| Lowest                                 | "   | "   | "   | ...               | 46°.0             | 50°.3             |

Mean relative humidity of the air at 9 a.m. (complete saturation being represented by 100) ... .. 94%

Rain fell on 9 days to the total depth of ... .. 2.53 in.

(Equivalent to nearly 12 gallons of water to the square yard.)

Heaviest fall on any day ... .. 1.22 in. on the 18th

The prevailing winds were from between north and south-east.

The average velocity of the wind was 3½ miles an hour.

There were 113 hours of bright sunshine, equal to 35 per cent. of the greatest possible amount. There were 6 days on which no sunshine was recorded.

*November.*—The most noticeable feature of November was the mildness of the weather throughout the month, and although as a rule the temperature was not remarkably high, yet readings of 60° and upwards



were recorded at many widely separated places, generally at the commencement of the month. At the close of the first week there was a short spell of colder weather, the thermometer falling to below  $20^{\circ}$  at Wisley, and sharp night frosts being experienced generally from the 8th to the 11th. On the grass the temperature fell still lower,  $16^{\circ}\cdot5$  being the lowest point reached at Wisley, whilst at Greenwich it dropped to  $9^{\circ}$  and in Mid-Wales to  $7^{\circ}$ . Taking the month as a whole it was the warmest November experienced for several years. Winds from the south-westerly quadrant predominated, but over the southern part of the kingdom it frequently blew from northerly and easterly points. The amounts of sunshine recorded were as a rule above the average, and varied from about 40 per cent. of the possible amount in the Channel Islands to only 8 per cent. in the Shetlands; at the Garden it amounted to 29 per cent. Rain-fall was below the average except in the northern parts of the kingdom, and the number of days on which rain fell was generally small. Over the greater part of the Midlands the fall amounted to less than an inch, and to less than two inches over the eastern half of the kingdom from the Channel to the Moray Firth.

Observations made at Wisley :

|                                                                                                                                                     |     |              |     |     |     |                |                |                |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|-----|--------------|-----|-----|-----|----------------|----------------|----------------|
| Mean temperature of the air in shade                                                                                                                | ... | ...          | ... | ... | ... | 46° 2          |                |                |
| Highest                                                                                                                                             | "   | "            | "   | ... | ... | 60°·9          | on the         | 1st            |
| Lowest                                                                                                                                              | "   | "            | "   | ... | ... | 19°·8          | "              | 10th           |
| Lowest                                                                                                                                              | "   | on the grass | ... | ... | ... | 16°·5          | "              | 10th           |
|                                                                                                                                                     |     |              |     |     |     | At 1 ft. deep. | At 2 ft. deep. | At 4 ft. deep. |
| Mean temperature of the soil at 9 a.m.                                                                                                              | ... | ...          | ... | ... | ... | 46°·5          | 48°·6          | 50°·7          |
| Highest                                                                                                                                             | "   | "            | "   | ... | ... | 51°·9          | 52°·8          | 53°·2          |
| Lowest                                                                                                                                              | "   | "            | "   | ... | ... | 40°·6          | 41°·6          | 49°·1          |
| Mean relative humidity of the air at 9 a.m. (complete saturation being represented by 100)                                                          | ... | ...          | ... | ... | ... | ...            | ...            | 90%            |
| Rain fell on 11 days to the total depth of                                                                                                          | ... | ...          | ... | ... | ... | ...            | ...            | 0·67 in.       |
| (Equivalent to about 3 gallons of water to the square yard.)                                                                                        |     |              |     |     |     |                |                |                |
| Heaviest fall on any day                                                                                                                            | ... | ...          | ... | ... | ... | ...            | 0·28 in.       | on the 21st    |
| The prevailing winds were from between south and west.                                                                                              |     |              |     |     |     |                |                |                |
| The average velocity of the wind was $5\frac{1}{2}$ miles an hour.                                                                                  |     |              |     |     |     |                |                |                |
| There were 76 hours of bright sunshine, equal to 29 per cent. of the greatest possible amount. There were 8 days on which no sunshine was recorded. |     |              |     |     |     |                |                |                |

*December.*—The weather of December was in no way remarkable until the last week of the month. The temperature was rather above the average, and night frosts were rare and nowhere severe. The winds blew almost constantly from the south-westerly quadrant, and were not only mild but also of moderate strength, and although rain fell frequently there were no very heavy falls. At Christmas time, however, a change set in; the wind shifted to the north-east, and a current of cold polar air swept across England, bringing with it severe wintry weather, and in many parts deep snow. A screen temperature of  $1^{\circ}$  was registered at Liphook, and at Wisley a reading of  $7^{\circ}\cdot5$ , whilst on the ground the grass minimum thermometer fell to zero at Wisley, and to  $8^{\circ}$  below zero at Epsom. At many places the snow buried the thermometer and rendered its record useless. In Scotland the cold was less severe, and in Ireland it was scarcely felt, as was also the case in western Cornwall. The cold spell was, however, of brief duration, and on the 30th a milder air set in. The





## NOTES ON SOME HYBRID TUBEROUS SOLANUMS.

By REV. J. AIKMAN PATON, M.A., B.Sc.

IN the summer of 1907, among other crosses, I effected two on *S. Maglia*, the white-flowered Chilian wild potato. Twenty-five berries were formed and grew (pollen of several different varieties, wild and cultivated, being used), but of these only two were found to contain sufficiently matured seed—one seed in each berry. The pollen parents were (1) *S. "etuberosum"* (so-called),\* and (2) a Chilian cultivated variety (*Francesa Col.*). The two resulting seedlings showed a marked difference from the beginning, the former being much more vigorous.

(1) *S. Maglia* × *S. "etuberosum"*: sown March 28, 1908; first flower July 1, first berry July 6 (thirty-one berries altogether); taken up December 7; tubers white [a].

This seedling, a very strong one, resembles *S. "etuberosum"* in having a green stem and soft foliage, but the leaflets are much larger, like those of the cultivated sorts, from which, indeed, they cannot be distinguished. (The foliage of the parents is quite distinct, and in each case distinct from that of the cultivated forms.) The plant has the branching habit of *S. Maglia* fully developed, almost every node for a good way up the stem producing a branch. The leaves seem immune from attack by the fungus *Phytophthora infestans*. The corolla is large, measuring about two inches from tip to tip—very much larger than that of either parent—mid-violet in colour, with white tips. (*S. Maglia* has pure white flowers, *S. "etuberosum"* pale lavender (No. 207, 1),† with violet tinge on back rays.) The trusses are very large and abundant. The stamens are large and finely formed, straight (those of *S. Maglia* are usually curved inwards) like those of *S. "etuberosum"*, but much larger, and full of fertile pollen. The style very slightly projects beyond the stamens. Thirty-one berries have formed on the plant, all due to artificial pollination. The berries are unlike those of either parent, being large, round, of a beautiful green colour (No. 243, 4, shading to No. 271, 2 and 1),† without spots, quite like the common potato berries. (*S. Maglia* has laterally compressed round berries; *S. "etuberosum"* has ellipsoidal white-spotted berries, and in both they are much smaller than those of the hybrid. The tubers are in colour quite white (those of *S. Maglia* are violet (No. 191),† those of *S. "etuberosum"* brownish-yellow-white), but of the same shape (although this varies greatly) as those of *S. Maglia*. They occur at the ends of short runners, as in some cultivated forms.

I have effected a number of crosses with the pollen of this hybrid on cultivated varieties, e.g. 'Jeanie Deans,' 'Duchess of Cornwall,' 'Eldorado,' 'Ninetyfold,' 'Peacemaker,' &c., showing that it is quite fertile. The seeds produced as a result of these crosses have been sown.

\* Its "selfed" seedlings seem to show that this is a hybrid. (See note p. 56.)

† These numbers refer to the colour numbers in the *Répertoire des Couleurs*.

(2) *S. Maglia* × a Chilian cultivated variety (*Francesca Col.*): sown March 28; first flower opened August 3; taken up November 11 [β].

This seedling entirely resembles *S. Maglia* in general appearance, and would at first sight be taken for that plant. It has dark branching stems and sparse, firm foliage, which is subject to disease about equally with *S. Maglia*. The flowers are scanty, the trusses small. The corolla is large, of mid-violet colour, with white tips (very like that of No. (1) seedling in size and colour)—one truss had pure-white flowers—the stamens strong, and straight, similar to those of No. (1), but not having so much or so fertile pollen; the style is longer, projecting beyond the stamens like that of *S. Maglia*. This plant had no berries, although every flower was pollinated. The tubers are in colour violet (No. 191, 1 and 2), like those of *S. Maglia*, of good shape, rounded oblong, smaller at the “rose” end than at the base, with white eyes. They were all found near the top of the soil in the pot, and are entirely free from disease, although the leaves were affected.

It is difficult to get seed from *S. Maglia*. Again this summer, although on one of my plants fifty-five berries set and swelled (due to many different crosses) only five of them have contained mature seed—one seed in each.

In 1907 I also effected a cross of *S. “etuberosum”* × ‘Duchess of Cornwall,’ and append brief notes of the fourteen seedlings resulting. The two dates at each are those of flowering (first flower open) and of taking up. They were all sown on March 19, 1908:—

1. July 15, September 15: White flower, would not “self”; fifty tubers, same as those of *S. “etuberosum,”* three slightly diseased; 19 $\frac{3}{4}$  oz.

2. July 16, October 31: Flower almost white, dark lavender rays at back, downy; sepals greenish, downy; tips green; three tubers, small, round, violet-black.

3. July 18, November 10: Flower pale mauve; back of petals rich mauve, rays hirsute; sepals brownish, hairy, tips brown; eleven tubers, red (No. 170, 3; or 105, 4); deep eyes.

4. July 19, September 28: Flower lavender; back of petals mid-violet; large anthers; little pollen; sixteen tubers, round, white, five slightly diseased; deep eyes; coarse. Very strong plant.

5. July 30, September 28: Flower uniform mauve; small truss; nine tubers (besides five largest diseased), round, oblong, white; fine; second growth started, one bud half inch long. (Too long in ground.)

6. August 1, September 28: Flower white, tinged creamy-pink; six tubers, oblong, white, small at end of runners; foliage diseased, September 18.

7. August 3, November 23: Flower not noted; very strong plant; 102 tubers, white, good size, many of good form, round; large lenticels.

8. August 4, not noted: Flower pale carmine-mauve; eleven tubers, fine, kidney form, white, flesh yellowish, two diseased.

9. August 5, September 23: Flower nearly as *S. “etuberosum,”* very pale mauve at centre, rest nearly white; pollen abundant; one small coloured tuber forming; foliage destroyed by disease September 15.

10. Not noted, September 28: Sixteen tubers, white, round, fine, an

improved "*etuberosum*" ; second largest tuber diseased, several pushing November 24. (Too long in ground.)

11. Not noted, September 14 : Eighteen tubers, white, round, early, no disease ; yellow flesh, very fine ; two pushing November 24.

12. Not noted, September 15 : Poor plant ; roots all gone ; five tubers.

13. Not noted, September 23 : Eight tubers, white with violet tint ; good.

14. No note made.

Another cross of *S. "etuberosum"* × Chilian variety gave twenty-two seedlings, some noteworthy.

I may mention the remarkable fact that a seedling plant of *S. "etuberosum"* "selfed" produced 481 tubers (probably 500, as some were lost), weighing over 3 lb., white, with no trace of disease. The flower of this plant is white tinged with violet, the back of the petals being pale violet with white edges ; the plant very strong, foliage also showing no disease. [A cross of this with [a] has given two good berries.] These selfed seedlings were planted out too late for the tubers to attain their proper size, but I have never known a *cultivated* seedling to produce so many tubers, although I have raised upwards of 13,000.



## NOTE ON "SOLANUM ETUBEROSUM."

By THE EDITOR.

IN 1835 Dr. John Lindley, F.R.S., F.R.H.S., figured and described in the "Botanical Register," t. 1712, under the name of *Solanum etuberosum*, a species of *Solanum* which had been introduced from Chile by the Royal Horticultural Society some years before. He describes the plant as a hardy perennial and states that "it bears rich clusters of deep purple blossoms, with a golden yellow centre, from July to October, and is very easily multiplied by dividing its stout rooting underground stems."

"Although extremely similar to the Potatoe (*sic*) in appearance, yet its larger and more compact flowers and its want of power of producing tubers renders it a proper plant for the flower garden."

"There can be no doubt that this is a species essentially distinct from the Potatoe, and yet it is impossible to point out any character by which it is to be positively distinguished, except the want of tubers and the smoothness of the calyx and flower stalks; these latter have a shining and nearly downless surface, instead of the rough dull appearance which we meet in those parts in the common Potatoe."

Dr. Lindley also emphasizes the absence of tubers and the smoothness of the calyx in a note to his technical diagnosis: "Facies omnino *S. tuberosi*, sed tubera nulla profert; flores majores sunt, brevius pedunculati, calyxque glaber est et lucidus, nec pilis hispidus. Species certo certius distinctissima, etsi notis levibus cognoscenda."

Mr. Paton considers that the plant which he has called *S. etuberosum* in his "Notes" (p. 53) is possibly a hybrid, since when it is self-fertilized its seedlings show marked variability.

Mr. A. Sutton, F.L.S., V.M.H., has included in his important studies of various wild forms and species of tuber-bearing *Solanums*\* a plant under the same name, which is apparently identical with the one Mr. Paton has employed. He also finds that, when self-fertilized, the seedlings of this plant vary to the same extraordinary degree, as is seen in the seedlings of the potato of commerce. This trait in the character of the plant, in which it differs from all the other wild forms cultivated by Mr. Sutton, has led him to believe that this "may probably be the parent form of the cultivated potato of to-day."

Mr. Sutton says, "The examples of *Solanum etuberosum* which I possess came originally from the Botanic Gardens, Edinburgh, in March 1887, through Mr. Lindsay, and again from the same stock in 1897 from Dr. Bayley Balfour. They produced at first small tubers about the size of walnuts, and the calyces are hispid; in other respects the plants are similar to the type specimen described by Lindley."†

The original source of the plant in the Edinburgh Botanic Gardens

\* See *Journ. R.H.S.* vol. xxxiii. pp. xxviii. and xxxvi. and vol. xxxiv. p. xxviii.; also *Journ. Linn. Soc.* vol. xxxviii. p. 446.

† *Journ. Linn. Soc.* xxxviii. p. 449.

is not known, but it is thought to have been introduced from a wild source. Some years ago we had tubers from Edinburgh, through the courtesy of Mr. Lindsay, F.R.H.S.; and, as in many other gardens, we found the plant to be quite hardy, but, as Mr. Sutton observes, to produce tubers abundantly (and under garden cultivation much larger than walnuts) and to have a hispid calyx: characters—which are well shown in the excellent plate\* which adorns Mr. Sutton's paper.

Thus, in the two characters upon which Dr. Lindley relied to separate his species from *S. tuberosum* the present plant is like *S. tuberosum*. It would therefore appear that this plant is not specifically identical with the one Dr. Lindley described, though with which, if with either, of the described species it should be included appears doubtful. Lindley's plant is probably lost to cultivation, but the type specimen is in the Lindley herbarium at Cambridge.

Mr. W. G. Baker† considers Lindley's plant "likely to be a variety of *tuberosum*" and notes there is a wild specimen, labelled with the same name in Mr. Reed's Chilian herbarium, which differs from the "type by its more hairy leaves and calyx and more pointed calyx teeth."

The Edinburgh plant, except in the characters mentioned above, agrees well with the description of Dr. Lindley's plant and in addition differs from *S. tuberosum* by the fruit, which is globose, having small whitish warts upon its surface. [Whether this is always the case is doubtful, since Mr. Sutton‡ figures a smaller berry without warts.] In addition Mr. Sutton observes that the pollen of *S. etuberosum* is always elliptical (a character which Mr. Paton does not confirm), and as this character is common to the undoubtedly wild forms of tuberous *Solanums* he concludes that in this plant we have to deal with a true wild species. The varieties of the cultivated potato produce pollen which varies in shape.

Perhaps the greatest interest attaching to the plant lies in the fact that both Mr. Sutton and Mr. Paton have found it, though growing among cultivated potatoes attacked by the dreaded *Phytophthora infestans*, to remain persistently free from the disease induced by that fungus; an observation that we are able to confirm. Since Professor Biffen has shown that, at least in wheat, disease resistance may be an hereditary character, it is to be hoped that by using this form as one of the parents (or grandparents) we may obtain a potato at last which will resist the attacks of the fungus which causes more loss every year to potato growers than any other.

\* *l.c.* t. 46.

† "Tuber-bearing *Solanums*," *Journ. Linn. Soc.* 1884, p. 489.

‡ *l.c.* pl. 46.

ANEMONE VARIATA [*A. FULGENS* × *STELLATA*].

By Mr. A. WORSLEY, F.R.H.S.

MANY years ago many varieties of Anemone intermediate between *Anemone fulgens* and *A. stellata* were noticed in the gardens of the French Riviera. In this district *A. fulgens* was then only to be found in gardens; it is admittedly a good species and reproduces itself fairly true from seed. On the other hand, *A. stellata* was to be found growing wild, especially about Cap Martin; yet this wild anemone is so inconstant in its characters, and so variable in its seed-progeny, that we are compelled to class it rather as a group of varietal forms than as a species in the generally accepted meaning of this word.

A few years ago Messrs. Vilmorin, Andrieux & Co., of Paris, put into commerce an alleged hybrid between these species, which, as I understand, they had themselves obtained from a private garden. This is the plant of which I am now treating. Quite recently the same hybrid appears to have arisen spontaneously in the garden of Messrs. van Tubergen, Jun., of Haarlem. In the latter instance the seed parent was a fine form of the species known in gardens as *A. fulgens annulata grandiflora*, and grew in a collection, amongst which were forms of *A. stellata*. As a result of sowing the seed of the former there arose an intermediate race differing in no other respect from the hybrid of Messrs. Vilmorin, excepting that it possesses a wider range of colour. This is not at all to be wondered at when we reflect that *A. fulgens annulata* is a bicolored form of *A. fulgens*.

Now although there is no direct evidence that any particular persons pollinated one species with the other, yet we have the evidence that an intermediate race springs up between these species when they are grown in juxtaposition, and that the origination of this intermediate race has been observed on three different occasions by credible witnesses. I will now show that the alleged hybrid holds a position equipoised between its alleged parents; beyond this no further evidence can be adduced until an analysis can be made of the subsequent generations springing from the self-fertilized hybrid plants—providing the same are not sterile.

On comparing the alleged parents we note only three characters in which they differ *inter se*, and in only one of these is this divergence very wide. They are as follows:—

|                                            |   |                          |
|--------------------------------------------|---|--------------------------|
| A. Foliage in male, slightly taller        | } | Hybrid takes after male. |
| a. " " female, " shorter                   |   |                          |
| B. Sepals " male, number 10 to 12          | } | " " " female.            |
| b. " " female, " 12 or more                |   |                          |
| C. Colour in male, white to purple or rosy | } | " " intermediate.        |
| c. " " female, intense scarlet             |   |                          |



The formula would therefore be  $Ab \frac{Cc}{2}$  in the individuals I have observed. But I would note that the only divergent character upon which we should place great importance is in the colour of the sepals. In this one respect there is no doubt that *A. variata* holds an intermediate position; but the doubt may certainly arise whether two forms of the genus which only differ markedly from each other in the one respect of colour should not be included in one species. On the other hand, as garden plants, *A. fulgens* and *A. stellata* are sufficiently distinct, the former being noticeable for the regularity of its intensely coloured sepals, and the latter for the comparative irregularity of its palish sepals and for its richness in albinos and albinoids.

The alleged hybrid is generally of an intense purple, and varies between a crimson-purple and a brilliant old-rose colour. Up to the present time I have not seen any other shades of colour.

## COMMONPLACE NOTES.

BY THE SECRETARY, SUPERINTENDENT, AND EDITOR.

## STATISTICS OF INTEREST TO BRITISH HORTICULTURISTS.

THE following statistics, abstracted from the Government Trade and Navigation Returns for 1908, are in continuation of those appearing in volume xxxiv, pages 97-98, of the R.H.S. Journal:—

TABLE I.—SHOWING THE IMPORTS OF FRUIT AND VEGETABLES DURING 1906-8.

|                                     | Quantities |           |           | Values      |             |             |
|-------------------------------------|------------|-----------|-----------|-------------|-------------|-------------|
|                                     | 1906       | 1907      | 1908      | 1906        | 1907        | 1908        |
| <b>FRUIT:</b>                       |            |           |           |             |             |             |
| Apples, raw . . . (cwt.)            | 2,808,732  | 3,526,232 | 3,376,579 | £ 1,753,577 | £ 2,231,327 | £ 2,079,703 |
| Apricots and Peaches . . . "        | 7,646      | 38,814    | 30,620    | 17,967      | 78,583      | 60,141      |
| Bananas, raw . . . (bunches)        | 6,425,704  | 6,232,158 | 6,385,449 | 1,903,639   | 1,771,095   | 1,769,249   |
| Cherries, raw . . . (cwt.)          | 191,106    | 165,412   | 160,479   | 245,906     | 199,489     | 235,523     |
| Currants, raw . . . "               | 106,718    | 109,130   | 102,110   | 139,773     | 142,245     | 121,852     |
| Gooseberries, raw . . . "           | 39,374     | 45,603    | 44,518    | 22,921      | 25,994      | 25,529      |
| Grapes, raw . . . "                 | 690,371    | 798,377   | 673,673   | 667,969     | 769,307     | 728,026     |
| Lemons . . . "                      | 849,935    | 882,193   | 1,045,009 | 440,406     | 421,599     | 471,713     |
| Nuts: Almonds . . . "               | 126,296    | 161,947   | 148,839   | 529,164     | 660,604     | 560,301     |
| " other nuts, used as fruit . . . " | 727,260    | 702,598   | 752,179   | 683,418     | 749,538     | 768,560     |
| Oranges . . . "                     | 5,230,991  | 6,120,185 | 5,663,841 | 2,183,411   | 2,454,569   | 2,269,651   |
| Pears, raw . . . "                  | 576,573    | 500,132   | 523,029   | 572,274     | 478,611     | 515,914     |
| Plums, raw . . . "                  | 891,113    | 325,761   | 402,881   | 758,720     | 345,720     | 428,966     |
| Strawberries, raw . . . "           | 52,164     | 44,178    | 33,391    | 64,777      | 54,186      | 45,791      |
| Unenumerated, raw . . . "           | 504,345    | 538,465   | 436,947   | 388,598     | 339,462     | 291,325     |
| <b>FRUIT, DRIED:</b>                |            |           |           |             |             |             |
| Currants . . . . . "                | 1,458,159  | 1,188,481 | 1,298,996 | 1,648,410   | 1,392,271   | 1,447,862   |
| Raisins . . . . . "                 | 584,956    | 708,053   | 763,013   | 1,106,889   | 1,209,576   | 1,207,902   |
| <b>VEGETABLES, RAW:</b>             |            |           |           |             |             |             |
| Onions . . . . . (bushels)          | 8,310,534  | 8,645,048 | 7,896,108 | 953,615     | 1,036,231   | 993,669     |
| <b>Potatoes</b>                     |            |           |           |             |             |             |
| { From Germany . . . (cwt.)         | 137,396    | 785,647   | 643,459   | 23,508      | 145,786     | 122,260     |
| { " France . . . "                  | 1,659,568  | 2,997,889 | 3,146,650 | 536,449     | 853,075     | 724,873     |
| { " Channel Islands } . . . "       | 1,170,372  | 1,947,237 | 1,206,607 | 501,695     | 742,610     | 564,172     |
| { " Other countries } . . . "       | 852,151    | 2,519,093 | 2,041,607 | 270,375     | 630,074     | 558,911     |
| Total . . . . .                     | 3,819,787  | 8,249,366 | 7,038,323 | 1,332,027   | 2,371,545   | 1,970,216   |
| Tomatoes . . . . . (cwt.)           | 1,124,700  | 1,135,499 | 1,160,283 | 953,475     | 1,020,805   | 955,985     |
| Unenumerated . . . . .              | 171,106    | 183,821   | 191,469   | 404,928     | 365,230     | 371,209     |
| <b>FLOWERS, FRESH</b> . . . value £ | —          | —         | —         | 233,884     | 233,641     | 229,802     |

It will be seen from the above that, excepting Bananas, Lemons, Nuts, Pears, and Plums, the imports of fruits in 1908, were considerably less than during the preceding year; and if compared with 1906, again a lessening occurs with five exceptions including Apples, Oranges, and Gooseberries. This reduction has, in almost every case, a corresponding lower gross value, though for Grapes, an import short of 1906 by 16,698 cwt. has an assessed value of £60,057 in excess of 1906 in a gross value of £728,026—a somewhat striking fluctuation. The imports of Apples have remained fairly stationary since 1904, though in 1908 4,569,546 cwt. were received.

TABLE II.—SHOWING THE EXPORTS OF FRUIT &amp;c., 1906-1908

|                                                                           | Quantities |         |         | Values    |           |           |
|---------------------------------------------------------------------------|------------|---------|---------|-----------|-----------|-----------|
|                                                                           | 1906       | 1907    | 1908    | 1906      | 1907      | 1908      |
| FRUIT :                                                                   |            |         |         | £         | £         | £         |
| Lemons . . . . . (cwt.s.)                                                 | 20,607     | 27,612  | 20,457  | 11,787    | 14,544    | 6,305     |
| Oranges . . . . . "                                                       | 291,206    | 340,294 | 248,421 | 127,597   | 136,475   | 100,746   |
| FRUIT, DRIED :                                                            |            |         |         |           |           |           |
| Currants . . . . . "                                                      | 40,901     | 21,829  | 22,128  | 43,379    | 31,328    | 57,402    |
| Raisins . . . . . "                                                       | 29,650     | 42,101  | 14,967  | 46,205    | 69,977    | 24,859    |
| Jams, preserved fruits, and confect-<br>ionary . . . . . (cwt.s.)         | 425,603    | 429,742 | 424,025 | 1,037,572 | 1,081,544 | 1,081,520 |
| Pickles and vegetables preserved in<br>salt or vinegar . . . . . (cwt.s.) | 707,723    | 794,762 | 670,773 | 120,388   | 63,433    | 125,865   |
| Provisions, unenumerated . . . . . (cwt.s.)                               | —          | —       | —       | 658,539   | 590,000   | 664,296   |

TABLE III.—SHOWING THE IMPORTS OF WOOD AND TIMBER  
DURING 1906-1908.

|                                                                                       | Quantities |           |           | Values     |            |            |
|---------------------------------------------------------------------------------------|------------|-----------|-----------|------------|------------|------------|
|                                                                                       | 1906       | 1907      | 1908      | 1906       | 1907       | 1908       |
| WOOD AND TIMBER :                                                                     |            |           |           | £          | £          | £          |
| Hewn : Fir, Oak, Teak, &c.<br>(other than Pit props or<br>Pit wood) . . . . . (loads) | 795,063    | 885,011   | 841,385   | 3,693,233  | 3,939,936  | 3,304,729  |
| Hewn: Pit props or Pit wood . . . . .                                                 | 2,451,669  | 2,827,209 | 3,041,440 | 2,713,005  | 3,049,434  | 3,579,355  |
|                                                                                       | 3,246,731  | 3,512,220 | 3,883,325 | 6,411,243  | 6,989,420  | 6,884,084  |
| Sawn or split, plane or<br>dressed . . . . . "                                        | 6,692,260  | 3,985,588 | 5,488,447 | 18,334,958 | 17,146,623 | 14,515,493 |
| Stakes of all dimensions . . . . . "                                                  | 139,041    | 171,721   | 147,028   | 632,568    | 736,422    | 682,105    |
| Furniture woods, Hardwoods<br>and Veneers :<br>Mahogany . . . . . (tons)              | 84,048     | 104,112   | 119,481   | 722,835    | 893,388    | 1,012,967  |
| Other sorts . . . . . "                                                               | 195,176    | 199,953   | 199,662   | 1,205,806  | 1,327,101  | 1,311,480  |
| Total of Wood and Timber . . . . .                                                    | —          | —         | —         | 27,507,410 | 27,093,954 | 24,306,059 |
| MANUFACTURES OF WOOD AND TIM-<br>BER :                                                |            |           |           |            |            |            |
| Furniture and Cabinet ware . . . . .                                                  | —          | —         | —         | 612,502    | 565,429    | 447,904    |
| House frames, fittings, and joiners'<br>work . . . . . "                              | —          | —         | —         | 272,949    | 224,596    | 209,632    |
| Other sorts (including wood ware<br>and wood turnery) . . . . .                       | —          | —         | —         | 1,131,377  | 1,130,691  | 1,313,343  |
| Total of Manufactures of Wood and<br>Timber (including furniture) . . . . .           | —          | —         | —         | 2,016,728  | 1,920,716  | 1,970,879  |

TABLE IV.—SHOWING THE EXPORTS OF WOOD AND TIMBER  
DURING 1906-1908.

|                                                              | Quantities |        |        | Values    |           |           |
|--------------------------------------------------------------|------------|--------|--------|-----------|-----------|-----------|
|                                                              | 1906       | 1907   | 1908   | 1906      | 1907      | 1908      |
| WOOD AND TIMBER :                                            |            |        |        | £         | £         | £         |
| Rough, hewn, sawn, or split,<br>and staves . . . . . (loads) | 15,127     | 17,719 | 16,925 | 91,575    | 111,841   | 97,592    |
| MANUFACTURES OF WOOD AND TIM-<br>BER :                       |            |        |        |           |           |           |
| Furniture and Cabinet ware . . . . .                         | —          | —      | —      | 760,334   | 801,603   | 661,840   |
| House frames, fittings, &c. . . . .                          | —          | —      | —      | 545,363   | 606,329   | 594,396   |
| Other sorts . . . . . "                                      | —          | —      | —      | —         | —         | —         |
| Total of Manufactures of Wood<br>and Timber . . . . .        | —          | —      | —      | 1,305,697 | 1,407,932 | 1,256,236 |



With 150,000 more bunches of Bananas received, the Return shows a reduced gross value of £2,000 compared with 1907, a pronounced reduction in prices. This fruit, and Lemons, show the highest increase in imports, and as both are foreign fruits, the general stability of the other outdoor fruits given in the Return would perhaps indicate that the home orchards are keeping pace with the increasing consumption—a consideration of satisfaction to fruit growers. The importations of Tomatos show a stationary figure for the past eight years, but those of Potatos reached a high level. The value of Fresh Flower imports is lower than the four preceding years by £4,000. This is satisfactory, as the four earlier years had been abnormally high in imports.

The exports call for little comment, as the figures show scarcely any or, perhaps, no variation beyond the average. The consumption of Oranges fell short of the previous year (1907), comparing imports and exports, by 364,000 cwt.

#### IMPORTS AND EXPORTS OF WOOD AND TIMBER.

The amount of unmanufactured timber imported is necessarily very high, though its value in 1908 fell short of the preceding year by nearly £300,000. Again, the value of imported manufactures of wood and timber increased by £50,000, while the value of the exports of this class of goods fell by £151,000. This would make British wood manufactures appear to be in a depressed condition, but comparing 1904 with 1908 we have valued exports of £170,258 and £1,256,545 respectively—a most wonderful comparison. Similarly the exports in 1903 were £179,902, and in 1902, £187,755, so that the advanced export of to-day is really highly satisfactory.

## BOOK REVIEWS.

"The Practice of Forestry." By Percival Trentham Maw. 8vo., 503 pp. (Walter & Walter, Heatherside, Brockenhurst, Hants, 1909.) 17s. 6d. net.

During the last few years a number of books have been written on subjects connected with forestry—the outcome no doubt of the afforestation question.

The present work is a valuable addition to those already published, though the high price will no doubt considerably restrict its circulation amongst those for whom it is specially intended. The subjects are very broadly treated and more from a scientific than practical point of view, and include almost all that is necessary for the student of forestry. There is one sentence that we would like to emphasize and that is Mr. Maw's remark that "As regards forestry education, I should like to express my opinion that British foresters can only learn their forestry in this country." No more truthful words were ever expressed, and it is to be hoped that in conjunction with the afforesting of waste lands by the Crown this important fact will be steadily borne in mind.

The book is divided into eighteen chapters, some of the most important being "The Financial Aspect of Afforestation," "Average Yields from Forest Lands," "Natural Regeneration" and "As to the Choice of Trees to Plant." The latter is a sadly neglected point in British forestry, and mainly to this neglect is due the unproductive nature of many of our woodlands. The "Sylvicultural Notes on Timber Trees" contain little that is new, and it is wrong to suppose that the Western Plane (*Platanus occidentalis*) is at all common in this country.

Regarding the "Forest Tables," that on quarter-girth measurement is only an extension of Hopper's, while basal areas are little required.

Altogether the work is a valuable one and reflects credit on the compiler.

"The Boy's Own Nature Book." By W. P. Westell, F.L.S., M.B.O.U. 8vo., 374 pp. (Religious Tract Society, London, 1908.) 3s. 6d.

It is rather difficult to decide for what class of readers this book of Mr. Westell's is intended. From its title one would certainly imagine that it was for boys, but if so, what interest could Chapter II., consisting of 28 pages, be to them? It certainly contains many moral lessons and appears to be intended for their teachers and not for them. Why then insert it? One finds many half-tone figures taken from photographs which could not interest anyone but quite a child, such as a lamb, a mare and her foal, a Jersey cow, evidently taken in a show-yard, a full-faced view, which does not show the points of the animal. Some of the notes in "Nature's Year" are very trivial, and not worth mentioning. In commenting upon the many strange local names given to some birds, he says, "The common partridge probably possesses the most curious name

of any British species of feathered folk in that of 'bird.' It is evident that he has not mixed much with shooting men; in old times the name was no doubt given by them to the partridge, which was then the bird *par excellence* in their estimation, and to this day a sportsman will use the word "bird" when speaking of a partridge.

On page 252, in alluding to the grubs of "Ichneumon flies" the following curious expression is used: "In a word the little mite eats its own environment." The writer should have said the little grub, so as not to run any risk of being misunderstood; the word "environment" is hardly suitable for a boy's book, and it is generally used with a totally different significance. The author in writing about ichneumon flies is apparently dealing with a matter of which he knows nothing. They are insects belonging to the order *Hymenoptera*, and like the other members of the order have four wings, and as a rule their bodies are long and slender, and are very unlike the figures given. These figures represent two-winged flies belonging to the order *Diptera* and presumably to the family *Tachinidae*, a subdivision of the family *Muscidae* to which the common bluebottle flies and house flies belong. These flies, as well as the ichneumon flies, lay their eggs in the caterpillars of various insects, and the grubs when hatched devour their hosts in much the same way as the ichneumon grubs do. The figures illustrating this subject are very poor indeed.

The author is puzzled because the name of bittercress is given to the Lady's smock, or Cuckoo-flower (*Cardamine pratensis*), as the leaves have not a bitter flavour. But the term bittercress in various botanical works is applied to all the species belonging to this genus; one of the species is *C. amara*.

On page 283, the common oak galls known as "marble galls" are said to be "oak apples," which are a very different kind of gall, very much larger, of quite a different consistency, containing a large number of grubs, and not quite spherical as the marble galls are. The author's views as to the formation of oak galls are not those accepted at the present day; the cause of the formation of the galls is not the piercing of the tissues of the plant by the gall-fly when laying her eggs, but the action of the grub when it is hatched feeding on the tissues, which appears to cause a more abundant supply of the sap of the plant to that part, resulting in the abnormal growths known as galls. Should the grub die, the growth of the gall ceases, showing that it is the action of the grub which causes the growth.

The description of the cause of double apples is altogether incorrect. We do not find in the case of double apples that each has a separate stem as they would have "if the growth of two fruits in close proximity to one another became fused together, thus forming a double fruit." The explanation of the monstrosity is that two flowers were formed on the same pedicel so that they were in such close proximity that there was a fusion of the two young fruits.

In a pocket in the cover at the end of the book are two folded plates, one of the British butterflies, the other of their caterpillars and those of some moths. These insects are briefly described in two appendices. The figures of the butterflies are fairly good, but some of those of the



caterpillars are regular caricatures. No indication is given of the real size of the butterflies, which is a great omission. Unmounted folded plates soon become useless in the hands of an ordinary boy. The book is well printed and profusely illustrated, but many of the plates, in spite of the praise bestowed on them, are very poor, and of very trivial subjects. We cannot altogether congratulate the Religious Tract Society on the publication of this volume, or the author on its compilation.

"That Rock Garden of Ours." By Professor F. E. Hulme. 8vo., 328 pp. (Fisher Unwin, London, 1909.) 10s. 6d. net.

Professor Hulme very wisely does not waste much space in the introductory words of this welcome volume, but quickly plunges into the book itself, which is written in a most practical and interesting style, quite different from many works dealing with horticulture. The whole book is filled from cover to cover with the author's life experience of plants and their habits, and the many qualities or virtues that plants were supposed by our ancestors to possess. A mass of information is given on the conditions most suitable for rock plants. Some curious facts illustrating the distribution of plants are given, as, for instance: A house was pulled down in Whitehall; it had no garden attached, the only open space being a paved stable-yard, which was covered with brick rubbish, mortar, and the like; yet on this unpromising material there sprang up rosebay and thirty-four other flowering plants, besides numerous grasses and bracken. From a ball of clay taken from a partridge's foot Darwin grew eighty-two plants belonging to six different species. Grass seed was sent to Japan to sow on railway embankments, and with the grass seed were various wild plants; many of these, as the daisy, buttercup, and dandelion, have settled happily in their alien surroundings. However, to return to the rock plants, we are glad to see the author recommending very strongly many plants considered too common for the rockery in these days, particularly ferns and other plants which are found growing naturally on rocks and cliffs, and surely deserve a place on all rockeries. The book is excellently printed, with eight coloured plates and forty-two other illustrations.

"The Laying-out and Upkeep of Golf Courses and Putting Greens." By Martin H. F. Sutton. Obl. 8vo., 46 pp. (Simpkin, Marshall, London, 1908.) 2s. 6d. net.

This is one of the most practical publications that we have on the making and care of golf courses. The advice on the drainage, preparation of soils, enriching soils, quantity and selection of the proper seeds to sow on different soils, is exactly the information that many of us want. We were a little surprised to find Mr. Sutton expressing an unfavourable opinion of *Poa annua* for the formation of turf, our experience being that few if any grasses will stand more wear and tear on a poor soil, but we are in complete accord with him in speaking well of all the grasses he names. *Festuca ovina tenuifolia*, *Poa pratensis*, and *Festuca duriuscula* are all good wearing grasses. The information on the upkeep and improvement of greens and the manures to use is valuable. There is no doubt

that this subject has not been as carefully thought out in many places as it should have been, and manures have been used that have had the effect of covering the greens with clover. Mr. Sutton says "the application of farm-yard manure as a top-dressing cannot be tolerated for a moment. It is both offensive and unsightly." Another reason may be added: it is liable to cause a quantity of noxious weeds to spring up, and result in no end of trouble to eradicate them. A great deal of other valuable advice is given of the most practical character, that will be most serviceable to golf players, and to those who have lawns.

"Studies in Fossil Botany." By D. H. Scott, M.A., LL.D., F.R.S. Ed. 2. Vol. i. Pteridophyta. 8vo., 363 pp. (Black, London, 1908.) 6s. net.

This work is one which no advanced student of botany or geology can afford to neglect. The first edition of Dr. Scott's "Studies in Fossil Botany" published in 1904, was based on a course of lectures given at University College, London, in 1896. The matter contained in these lectures was brought up to date in 1904, and the book then published at once took first place among works dealing with Fossil Botany. The style, at once simple and lucid, without being merely "popular" in the less reputable sense of that term, made the book one which could be read and enjoyed, as few books can be which deal so thoroughly with any branch of knowledge. But, as the author stated in 1904, "happily Fossil Botany is an eminently progressive branch of science and thus the mere lapse of time has necessitated the introduction of much new matter and of many new points of view." This is still more true at the present time. The progress of the science has necessitated remodelling and almost completely rewriting the book.

The discoveries of Oliver, Kidston and others, including the author himself, have brought to our notice the great Paleozoic group of fern-like seed-bearing plants the Pteridosperms. Fossils, formerly thought to belong to the ferns proper, have been (metaphorically) "pieced together" with wonderful skill and industry to form seed-bearing types of the new group. But the ferns proper have not been neglected. The ancient synthetic group, the *Botryopterideae*, have been more fully investigated and must, of necessity, be considered in any scheme dealing with the phylogeny of Pteridophytes. In America Dr. Wieland has published the results of many years' labour on American fossil Cycads and his discovery of the hermaphrodite strobilus of *Cycadoidea ingens* has stimulated research and speculation concerning the origin of the Angiosperms. Such discoveries as these could best be described and collated by the author of "Studies in Fossil Botany," and Dr. Scott has decided to bring out the new edition in two volumes.

The first volume, dealing with Pteridophyta, contains less that is new than will be given in Part II.; hence its earlier publication. The chief additions to Part I. include work by Mr. Hickling on *Paleostachya* and M. Halle's researches on Mesozoic Equisetales. Dr. Scott's own work on *Sphenophyllum fertile* and Prof. Nathorst's discovery of the Pseudo-borniales are described. The probable connection between the Sphenophyllales and the Equisetales is clearly and critically discussed as well as the connection between the *Psilotaceae* and the *Sphenophyllaceae*. In the

Lycopodiales stress is laid on the development of the "seed habit" in plants (*Lepidocarpon* and *Miadesmia*) which are remote from the main line of the descent of seed-bearing families. Necessarily, the chapters on Paleozoic ferns have been much altered, descriptions of many "fern fronds" and "fern impressions" being transferred to Part II., since many of these fossil "ferns" have now been shown to be Pteridosperms.

The ferns proper receive full and accurate treatment; doubtful cases are discussed and the new work on the *Botryopterideae* is thoroughly well described and critically considered. The book is admirably illustrated by photographs reproduced from original papers and by clear drawings by Mrs. D. H. Scott and Mr. G. T. Gwilliam. It is a work which will make the reader impatient for Part II., and we trust that in view of the importance of recent work on Fossil Spermatophyta the publication of the second volume will not be long delayed.

"Trees and Shrubs of the British Isles, Native and Acclimatised." By C. S. Cooper, F.R.H.S., and W. Percival Westell, F.L.S. Part I. 4to., xii + 12 pp. (Dent, London, 1909). 1s. net.

Though there is little new in this book, yet the minutely accurate and beautifully executed illustrations—indeed the whole get up of the work—should recommend it to everyone who is interested in the trees and shrubs that have been found suitable for cultivation in this country. The work is to be completed in sixteen parts, and if the succeeding numbers be equal to the first the whole will form a useful book, while the low price will bring it within the reach of all. We are promised chapters on almost every subject bearing on trees and shrubs—soils, planting, insect and fungoid pests, the age of trees, commercial products, plea for an Arbor Day, seed, re-afforestation. Than the coloured picture of the strawberry tree (*Arbutus Unedo*) which accompanies the first part of the book nothing more accurate or beautiful could be desired.

"Our Forests and Woodlands." By John Nisbet. New and revised edition. 8vo., 348 pp. (Dent, London, 1909.) 3s. 6d. net.

If only for the chapter on "Ancient and Modern Forestry" this book is well worth perusal, and Mr. Nisbet is certainly to be congratulated on the result of his research in that way, for a fuller account of the rise and progress of forestry in this country has not before appeared. We would strongly recommend everyone who has an interest in forestry to read the chapter. Regarding the rest of the book, there is nothing new, the descriptions of our commonly cultivated trees and the uses to which the timbers are applied being old news re-garnished and freshly dished up. The work is pleasantly written, sparsely illustrated, and being cheap will come within the reach of all.

"The Moths of the British Isles." By R. South, F.E.S. Second series. 8vo., 376 pp. (Warne, London, 1908.) 7s. 6d. net.

Messrs. Warne have recently published the second series of "The Moths of the British Isles comprising the families *Noctuidae* to *Hepialidae*,"



which under the new classification of these insects also includes the *Geometridae*, *Zygaenidae* (or Burnet flies), *Cossidae* (Goat moth), *Sesiidae* (Clear wings), so that the three volumes by Mr. South—the Butterflies and the first and second series of Moths—contain figures and descriptions of all the British Lepidoptera except those commonly known as Micro-Lepidoptera (the *Tortricae* and *Tineae*). The author in his preface says, speaking of these: "The small fry, as they have been called, exceedingly interesting though they may be to a limited number of students, have therefore been left for separate treatment at some more convenient season." All collectors of British Lepidoptera will earnestly hope that Mr. South will soon find this "more convenient season," for though the students of the Micro-Lepidoptera may not be so numerous as those who study the more attractive groups, their numbers would soon increase if they had a volume similar to those already published to help them. This volume, like its predecessors, is admirably got up. The coloured plates are excellent; No. 41 is perhaps the least satisfactory, the colours of the moths (the large and small emerald) do not show up well against the tinted background. The black-and-white figures are very clear, but are rather hard and diagrammatic; the hardness may be accounted for to some extent by the smoothness of the paper on which they are printed; they, however, serve their purpose very well. The letterpress gives terse but very clear descriptions of each species both in the perfect and caterpillar states, with some details of their life history and the localities where they may be found. In the preface we read: "Both classification and nomenclature are always under revision, and we are probably a long way from hearing the last word concerning either; these are, however, matters that cannot be ignored even in a popular work, consequently I have ventured to adopt sundry changes in arrangement, and names although not departing from the old style in any very large way, still approach pretty closely to the new. It would have been of great assistance, however, in this matter if a table had been given showing the classification adopted in this work, which should be in the hands of everyone who collects or is interested in British Lepidoptera. There is no other book which can be said to cover the same ground in such a thoroughly satisfactory manner."

"Beautiful Flowers and How to Grow Them." By Horace J. Wright and W. P. Wright. Complete in 17 parts (Jack, London, 1908). 1s. each part.

We have before us the first nine parts of this work, which is admirably printed and artistically got up. When we state that there are 100 coloured plates by such talented artists as Beatrice Parsons, Eleanor Fortescue Brickdale, Anna Lea-Merritt, Hugh L. Norris, Lillian Stannard, Margaret Waterfield, A. Fairfax Muckley, and Francis E. James, it is at once evident how well they are done. The first part is given up entirely to roses, the second part principally to bulbs, which run well into the third part, and the fourth and fifth parts entirely to herbaceous plants. The sixth part is chiefly devoted to rock plants, of which a capital descriptive list is given, and good cultural hints. Parts 7 and 8 are nearly all taken up with stove and greenhouse plants, the kinds and varieties finding most favour being dealt with in a very practical manner.

Part 9 is largely devoted to window and room plants, and finishes Vol. I., filling 200 pages. Vol. II. commences in this part, and begins with a chapter on Carnations followed by one on Dahlias.

"The Flowers and Gardens of Japan." Painted by Ella du Cane. Described by Florence du Cane. Sm. 4to., 294 pp. (Black, London, 1908.) 20s. net.

In the very first sentence of her preface to "The Flowers and Gardens of Japan" Miss Florence du Cane makes a statement with which it is impossible to agree. She says "An apology is due to the reader for adding this volume to the long list of books already written on Japan." For such an altogether delightful book no apology whatever is needed, but rather the thanks of all flower-lovers are due to the Misses du Cane for giving them a charming book on a fascinating subject. This is not a great book, nor a deep book, nor does it pretend to be a text-book. Readers wishing to study seriously the mysteries of Japanese landscape gardening with all its symbolism and its rigid laws and ceremonies are referred to Mr. Conder's wonderful "Landscape Gardening in Japan." As Conder caters for the student, so the Misses du Cane cater for the *dilettante*, and give us the flowers and gardens of Japan as seen through European eyes. The illustrations are typically from the European standpoint. The predominant idea in a Japanese garden is form and line and proportion. Colour is rather a secondary consideration. Not a word need be said against the form and line and proportion in Miss du Cane's paintings, but it is evident in practically very one of the fifty drawings reproduced that colour, in a charming setting, but always colour was the main factor which impelled her to paint. This is of course as it should be in a book whose object it is to charm rather than to instruct, to show us the gardens of Japan as we should see them rather than as the Japanese see them.

As examples of "three-colour" reproduction from water-colour drawings these illustrations are very fine indeed. Miss du Cane gives a feeling of atmosphere in an extraordinarily clever way. Some of her drawings drag you right out into the open air. The texture and modelling of her rocks and stones are very subtle, and the accuracy, with breadth of treatment, of her flower masses most fresh and satisfying; yet happily, in reproducing and reducing her paintings for book illustration, these fine qualities have been preserved wonderfully well.

Charming as are the paintings illustrating "The Flowers and Gardens of Japan," the letterpress is equally interesting and delightful. A great amount of Japanese garden lore, together with many excellent pieces of descriptive writing, are given. The first chapter deals with Landscape Gardening. Although we may learn much from the Japanese in this art, how futile it seems to attempt a true Japanese garden in England! It is probable that no Englishman would ever make the real thing. Even after a life's study of the subtle technicalities of the art he would lack the Japanese mind, and to his unlearned fellow-countrymen his work would remain a curiosity with some beautiful points and many meaningless accessories. Let us learn from the Japanese, not imitate them parrot-wise. It would be better almost to stick to a good honest circle



of scarlet, blue and yellow, of geranium, lobelia and calceolaria, than produce some of the hybrid atrocities which have recently been perpetrated in this country under the name of Japanese Gardens. Chapter II. deals with Stones, Ornaments and Fences, and Chapter III. with Landscape Gardens; and then follow chapters devoted to Nursery Gardens, Dwarf Trees and Hachi-Niwa, the wonderful miniature landscape gardens representing whole scenes within the space of a shallow dish. The night fairs in Kyoto must be fascinating. Miss du Cane says of them: "On April 1 the best night-market is held. The stalls will be covered with tempting little flowering trees, their buds almost bursting and full of promise of lovely blossoms to come; sturdy little peach trees, their branches thickly covered with soft velvet buds just tinged with pink; drooping cherries wreathed with red-brown buds; slender *Pyrus* trained into wonderful twisted shapes; little groves of maple trees, their scarlet or bronze leaves just unfurling; or miniature forests of larch, shading mossy ravines with rivers of white sand; ancient pine trees spreading their branches over rocky precipices rising from a bed of pebbles; sweet-scented *Daphnes*, golden-flowered *Forsythias*, and early *Azaleas* in porcelain dishes, which are round or oval, shallow or deep, and of every shade, from white through soft greys and blues to a deep green." These treasures are to be bought at from a few sen to two or three yen! Then follow an interesting chapter on Temple Gardens, and a delightful one on Summer Flowers. In May Miss du Cane visited Matsushima, the land of the pine clad islands, and later Nikko, to see the *Azaleas*, a gorgeous feast of colour. Her description of *Lilium auratum* in its wild state is worth noting from a cultural point of view. She says: "By the middle of July the big buds of *Lilium auratum* will be fighting their way through the rank growth along the roadside, and in a few days the air will be filled with their scent. Often I was attracted by their fragrance, perhaps all the more remarkable in a land which alas! is not famed for sweet smells, and then far above one's head, hanging defiantly out of reach, could be seen a single splendid bloom of this king among lilies. They seem to love the shelter and dampness of the wood, where the falling leaves each autumn make a fresh covering for their bulbs. Once I tried to see how deep in the earth the bulbs were buried, but I did not succeed in getting down low enough, and could only tell, from the mark on the stem of the lily which had been pulled, that about 8 or 10 inches seemed to be the usual depth of the bulb." How often gardeners in England fail to get *Lilium auratum* to grow, through not planting it deep enough! Other chapters deal with Peach, Plum and Cherry blossom, *Wistaria* and *Paeony*, the *Iris*, the *Chrysanthemum*, *Maple*, *Pine* and *Bamboo*, &c.

"The Flowers and Gardens of Japan" is a book to read as well as to look at, and, as has already been said, no apology for its production is necessary.

"The Florist's Bibliography." By C. Harman Payne. 8vo., 80 pp. (Wesley, London, 1908.) 3s. 6d. net.

This book has been prepared by a lover of books, and is a useful guide to those forming a library dealing with florists, flowers, and the flower garden.



There is a curious frontispiece which has been copied from an old French work on the auricula published in 1738, evidently taken at a time when auriculas were not in flower, as those represented are caricatures. Mr. Payne is a book collector, a lover of old gardening books, and the preparation of this book has been a labour of love to him. There is one important omission, as the author mentions in the preface, the rose. He says there is "no need to go over the ground again that has been traversed by Señor Vergara, although a supplement to his 'Bibliografía de la Rosa' might now be reasonably considered desirable." The author has quoted from first editions as far as practicable. The book is useful also in letting us know what we want as well as what we have. There are nine works mentioned dealing with the auricula, but the latest is fifty years old. The auricula is a more popular flower, and much better grown now than it used to be; as its culture is better understood there is room therefore for a trustworthy treatise on the auricula. Indeed the author of the treatise alluded to has passed away, but he was not a cultivator. The date is 1857. Bulbs and bulb culture have been well dealt with in quite recent years; the latest book is by Mr. John Weathers ("Beautiful Bulbous Plants, 1905"). There are many old and modern books on the Hyacinth and also on the Lily; and, showing the importance of the Tulip, there are twenty-four books dealing with it, the oldest dated 1654, the newest 1907. The Carnation, Picotee and Pink are credited with forty-eight works beginning with "Le Jardinage des (Eillets," Paris, 1647, by "L. B.," and the latest, also published in Paris, "Essais sur l'histoire de quelques fleurs d'ornement: L'Eillets" (Le Texnier, 1908). Of course the carnation had been written about in the sixteenth century, although not in the form of a special treatise; the importance of the Chrysanthemum as a garden favourite is amply demonstrated by the fact that no fewer than 103 books are enumerated and thirty-three society publications. Of course there would be no book on the chrysanthemum earlier than the nineteenth century: the earliest quoted by Mr. Payne was published in Vienna in 1833 by J. B. Rupprecht; the earliest in England in 1843 by Mr. Tyas. The late Mr. J. Dale, of the Temple Gardens, wrote an excellent treatise which was published in 1856. Modern books are plentiful on this subject. Thirty-six books are enumerated dealing with the dahlia, and several society publications. The dahlia seems to have occupied public attention in France earlier than in Britain. Jacquin Frères published an essay on the cultivation, classification, and nomenclature of the dahlia as early as 1828, and between that date and 1841 inclusive there were twelve books published in France dealing with it.

No one but a lover of books would have taken the trouble involved in searching out and classifying such a large number of books in English, French, and German, treating on every subject connected with the flower garden, and especially with what are termed florist's flowers. The book should find a place in every garden library.

"Little Gardens, and How to Make the Most of Them." By H. H. Thomas. 8vo., 152 pp. (Cassell, London, 1908.) 1s. net; cloth 1s. 6d. net.

A capital little book for the amateur, full of the information he needs, clearly dealing with the making of a garden and all it entails. In the

next edition we would suggest to the author to add "English or Broad-leaved" to Paradise stock on p. 143, as this is infinitely superior to the French Paradise stock: the latter should never be used in this country when planting bush or pyramid trained trees. We also think it must have been a printer's error to place "Beauty of Bath" amongst cooking apples, as this is of no value for cooking, but is one of the best early dessert varieties. With these exceptions we have nothing but praise for the little work.

"Garden Rockery: How to Make, Plant, and Manage It." By Francis George Heath. 8vo., 173 pp. (Routledge, London, 1908.) 1s.

To anyone about to construct a rockery this will be a very useful book, as it points out what to do and what to avoid. With many the tendency is to attempt too much, to use too much stone, making the rockery very artificial instead of natural. Again, the way in which stones are placed in the rockery is of vast importance, and here the instructions of the author will be most serviceable, showing by illustration how they should be fixed. There is an excellent list of plants suitable for the rockery, and the whole is well printed and illustrated.

"Alpines and Bog Plants." By Reginald Farrer. 8vo., 288 pp. (Arnold, London, 1908.) 7s. 6d. net.

This may be described as a companion book to "My Rock Garden," being written and printed in the same style. The present volume is sure to be appreciated, as it treats a very popular phase of present-day gardening, and we venture to think a phase that will become still more popular, as many garden-owners are now taking less interest in their glass erections, and developing Alpine, bog, and water gardening to an extent probably never equalled before. From the first chapter on "Shrubs and their Placing" and the second chapter on "Shrubs, mostly Evergreen," one may learn valuable lessons, as the author has studied the plants in their native habitat, and tells us under exactly what conditions they seem to thrive best. We are glad Mr. Farrer points out the hardiness of so many beautiful shrubs, as many who really love their garden have still little idea of the wealth of hardy shrubs; the beautiful *Nandina domestica* with its handsome foliage, for instance, so rarely seen, and quite as hardy as the common laurel, but infinitely more beautiful. The same applies to climbing plants; many still plant *Wistaria sinensis*, and we agree with the author that at her best she is but a poor pallid widow compared with the bridal opulence of *Wistaria multi-juga*. This is only one example of what Mr. Farrer points out as desirable improvements in our gardens; there are many others quite as good. The other chapters on Alpine plants, large and small Bog plants, Iris, Lilies, the Water Garden, &c., are all admirably written, and in such a clear manner that no one can fail to follow the author and his ideas all through the book. The illustrations are excellent.

"The Book of the Pansy, Viola, and Violet." By Howard H. Crane. 8vo. 106 pp. (Lane, London, 1908.) 2s. 6d. net.

In this book we have an excellent history of the pansy and viola, with exceedingly good chapters on their uses and cultivation, the insect and



fungoid pests that attack them, &c. Only a comparatively short chapter is given to the cultivation of the violet, with another one on the best varieties to grow. Where the violet is attacked by that persistent fungus that causes yellowish brown spots on the foliage, we cannot do better than quote the author's advice on p. 54: "Whenever this is seen the affected stem should immediately be removed and destroyed. Do not throw these diseased pieces on the rubbish-heap, but burn them." Although this advice is given for the disease on pansies and violas, it is equally good for the violet. We regret the author recommends the use of Violas as a groundwork for roses; our experience is most decidedly against it, as the rich food usually given to roses caused rampant growth in the violas, often a foot or more high, making the roses leggy in growth, and we also find a much greater percentage of deaths amongst the roses carpeted with violas than amongst those free from any carpet plant. The viola is so beautiful from early in the year till quite late in the season, that it is indispensable in most gardens, and we thoroughly endorse all that Mr. Crane says in its favour. We can confidently recommend the book to all lovers of these charming flowers, as it is full of sound practical information, that may be followed out easily by anyone.

"The Illustrated Strawberry Culturist." By Andrew S. Fuller. 8vo., 59 pp. (Kegan Paul, London, 1908.) 1s. 6d.

This book was written for American readers, and scarcely one of the varieties of strawberries named are known in this country; still there is so much interesting matter and a good deal of useful information in the book, that it is well worth the British grower's perusal.

"Gardens, Past and Present." By K. L. Davidson. 8vo., 232 pp. (Laurie, London.) 6s. net.

We have seldom read a book more pleasantly written or better printed than this. Many gardening books are dry and uninteresting except to the enthusiast, but even the least enthusiastic gardener will read these pages with pleasure and profit. Mr. Davidson tells us how in the far past ages, after the Roman Invasion, Julius Agricola fostered the cultivation of the land so much that, under him and his successors, Britain became one of the granaries of the world. He traces the history of the formation of physic gardens, and how the cultivation of vegetables was increased and became general through the settling of Flemish cloth-workers in this country. The chapter on "Trees Native and Naturalised" is very interesting. Naturally Kew takes the premier place as a Botanic Garden, and the author writes in an enthusiastic strain of its beauties and its practical assistance to the community, while the gardens at Edinburgh, Dublin, and other places receive their fair share of praise.

In the second part of the book present gardens are equally admirably dealt with, and most will agree with the author that the question of style should be governed by environment only, and not by any passing fashion of the day. To do away with formality in some of our old gardens would be to ruin them absolutely, yet occasionally we see this occurring.



“Bulbs and their Cultivation.” By T. W. Sanders, F.L.S. 8vo., 212 pp. (Collingridge, London, 1908.) 2s. 6d. net.

Like all the books written by this author, this work is full of sound practical advice and information, put together in such clear and pleasing style that it gives not only profit but also pleasure to read it. The book is divided into three parts.

The first part treats of hardy bulbs of all kinds, soils, manures, bulbs in beds, borders, and on rockeries, the naturalizing of bulbs, lifting and storing, outdoor lilies, bulbs in window boxes, &c., and a useful tabular list of bulbs.

The second part is devoted to indoor bulbs, and embraces the cultivation of almost every kind of bulb for the stove, warm or cool greenhouse, frames in water, and in fibre, forcing, &c. The soil, treatment, feeding, and other matters of both great and small importance are well dealt with, and no one can go far wrong in following the instructions.

The third part is taken up with the propagation of bulbs and tubers, their English names, pests and diseases, selections of the best varieties, and a most useful glossary of terms. We commend this book to all.

“The Book of Fern Culture.” By Alfred Hemsley, F.R.H.S. 8vo., 112 pp. (Lane, London, 1908.) 2s. 6d. net.

As might be expected from such a well-known plant-grower as Mr. Hemsley, this book is an excellent addition to the multitude of books now published on horticultural subjects. It is a pleasure to see the author advocating a sensible and economic system of growing ferns, *i.e.* treating them more like ordinary plants instead of keeping them in an atmosphere heavily charged with moisture. Every phase of fern culture, from the raising of the plants from spores to plants of the largest size, is dealt with; composts for different kinds and the very important subject of watering are admirably gone into.

“Stephens’ Book of the Farm.” Div. II. By J. Macdonald. 8vo., 280 pp. + many fine plates. (Blackwood, London, 1908.) 10s. 6d.

Div. I. of this work was reviewed in the last volume of this Journal, and the opinion then expressed applies to this book.

The subjects dealt with include Rent and Wages; Soils and Soil Improvement; Rotations; Manures and Methods of Application.

We consider this work the best of its kind available at the moment, although severe competitors are now appearing.

“Handbook of Geography, Descriptive and Mathematical.” By Dr. Emil Reich. 8vo., 2 vols., 568 pp. + 171 pp., 10 coloured maps, and many figs. (Duckworth, London, 1908.) 12s. 6d. net.

This work consists of two volumes, the first entitled “A Descriptive Geography of the World” and the second devoted to Astronomical or Mathematical Geography. The author tells us that “the first part, or Descriptive Geography, treats of the various countries of the five continents, and the chief aim was to enable the reader to form a fair image of each bigger landscape, or, in other words, to view each country, or big sections

thereof, from a standpoint so high in air as to admit of taking in at a glance entire provinces." We cannot say that he has succeeded in his effort, for he does not appear to have worked on any definite plan. Many of his pages contain innumerable short sentences and disjointed expressions in note form, making the reading very monotonous and even painful. The opening chapter on the British Isles covers thirteen pages, and deals entirely with physical features, no mention being made of our large towns and industrial centres. In some other chapters the method is reversed, for we find descriptions of towns but much less physical geography. India is treated in this way, and this forms one of the most interesting chapters, but the great range of the Himalayas is practically ignored. The description of the United States of America covers forty-two pages, and contains much useful information, but the vast Dominion of Canada is dismissed in six pages. The admirable set of maps would have better served their purpose had they been accompanied by some explanation in the text.

The feeling of disappointment with which one closes the first volume is speedily dissipated on opening the second, and one soon finds that here the author has succeeded in producing a book which should prove of the greatest use to both teachers and students.

"*Ruskin Nature Reader.*" Senior Book. Small 8vo., 236 pp., 20 illustrations. (Dent, London, 1908.) 1s. 6d. net.

This is described as "a collection of literary extracts to accompany a course of Nature Study; selected and edited by G. R. Bennett, B.Sc. (London)." Of the many so-called Nature Readers which have been produced in the last few years this is one of the most readable. An effort has been made to show "how Nature has appealed to men, and how men have expressed the influence which the observation of Nature has had upon their thoughts and their actions." How successfully this effort has been achieved is evident from even a cursory glance through the selected passages. We say a cursory glance, but we doubt whether any sensible scholar opening these pages will be satisfied till he has perused them all, and at the close he cannot but feel that he has been abroad with Dame Nature indeed.

The Editor has drawn largely on the friend of our youth, Gilbert White's "*Natural History of Selborne*," and has given us six charming extracts dealing with bird-life. The language is, of course, somewhat quaint, having an old-world ring about it, a certain charm of its own; but we would suggest that it might be worth while to conform to modern usages and modify such expressions as "an hundred pieces" (p. 13), "an hawk appears" (p. 36), "an hot stifled inn-yard" (p. 41), &c. We also note a slight typographical error on p. 35. Gilbert White certainly did not write "the motion of the mandibles *are* too quick for the eye." The choice of selections has been admirable, and we can heartily join with the Editor in his wish that, having been given a glimpse of the emotions and expressions of such men as John Ruskin, Professor Tyndall, Richard Jeffries, Louis Stevenson and Sir Martin Conway, boys and girls may be helped "to observe for themselves the things around them, and also to read and enjoy the beautiful thoughts of others concerning them." The

illustrations are good, but we should like to see a note made of the page to which each applies.

"Nature Study." By Professor Ainsworth Davis. Crown 8vo., 274 pp., over 100 photographic illustrations. (Dent, London, 1908.) 2s. 6d.

This is a Reader for the higher classes of schools, and attempts "to give in simple, non-technical language a connected sketch of the natural history of plants and animals." The book is divided into two parts, the first dealing with Botany and the second with Zoology. The botanical section is treated on the ecological plan, and the author has succeeded in producing a very readable introduction to plant study. The scholar is encouraged to carry out simple experiments, make careful observations, and draw conclusions as to how the details of form and structure have a definite meaning in relation to mode of life. There are two excellent chapters on the Struggle for Existence among Plants. A general survey is taken of our more common plants, and details of special interest pointed out. The second part of the book deals mainly with the classification of animals, and, although useful in its way, can scarcely be said to follow out the admirable plan of the botanical section. The author attempts to cover practically the whole of the animal kingdom, with the result that whole groups of animals have to be dismissed in a paragraph, and one has but little chance of making those observations which are supposed to be an essential feature of the new method of teaching.

On p. 70 we are told that "Begonia plants can be grown from a leaf, which develops roots and buds when placed in damp soil." This statement goes scarcely far enough, and might mislead a young reader. Reference might have been made to the method of insertion, and to the incisions usually made across the principal veins. The latter part of paragraph 425 (p. 151) seems scarcely grammatical, where it says: "The lamprey group (Cyclostomata) is an eel-shaped relative of the fishes, which has not yet developed a lower jaw, and uses its round mouth as a sucker." The illustrations are some of the best that we have seen employed for the embellishment of a school-reader, and we have no hesitation in saying that on the whole this is an excellent help to nature study in the schools.

"Eversley Gardens and Others." By Rose G. Kingsley. 8vo., 280 pp. (Allen, London, 1907.) 6s. net.

A well-printed and well-written book dealing with the making of a garden, soils, planting, pruning, spring gardens, bulbs, summer gardens, the rose garden, cut flowers, &c. The illustrations are very good, and a great deal of most useful information is given on the best methods of treating plants individually and collectively, showing a keen observing power on the part of the authoress. It is a handsome book, and will be highly appreciated by garden-lovers.

"Holly, Yew, and Box, with Chapters on other Evergreens." By W. Dallimore. 8vo., 284 pp., 175 illustrations. (Lane, London, 1908.) 7s. 6d. net.

We must congratulate Mr. Dallimore on this carefully written and admirably printed book. Such a practical work could only be compiled



by one thoroughly conversant with the many varieties of the plants he deals with. Mr. Dallimore's position as foreman of the Arboretum at the Royal Gardens, Kew, has given him unique opportunities for studying the peculiarities of all the varieties under his charge. Very valuable information is given on the habits of varieties of holly, yew, and box, and cultural descriptions are treated in a masterly manner. It is scarcely necessary to state that the work is well up to date, as proved by the inclusion of varieties new to this country from China, collected by Mr. E. H. Wilson for Messrs. J. Veitch. Many old and rare varieties are described, making the work one of special interest to tree and shrub lovers. A small portion at the end of the book is devoted to the evergreen oak, the laurel, and other evergreens, all as much worthy of the reader's attention as the other parts of the work. We predict this will be considered the standard book on the holly, yew, and box. The index is excellent.

"The Care of Natural Monuments with special reference to Great Britain and Germany." By H. Conwentz, Prussian State Commissioner for the Care of Natural Monuments. With ten illustrations. 8vo., pp. xii. and 185. (Cambridge University Press, 1909.) 2s. 6d. net.

We are not sure that the term "natural monument," the German *Naturdenkmal*, is either self-explanatory or otherwise satisfactory, though we cannot suggest anything better. Professor Conwentz makes out a good case for his neologism. Not only can he urge that standard works are styled monuments of literature, and that lake-dwellings, which were certainly never "established in commemoration" of any body or event, are termed prehistoric monuments; but that Humboldt long ago spoke of big trees as *monuments de la nature*.

This modest but usefully comprehensive little volume, which originated in a lecture delivered by the author at the Leicester (1907) meeting of the British Association, practically begins with a classification of the natural monuments in danger. It then deals with the means of preservation and the extent to which these are realized in the various countries of the world, concluding with suggestions for the future.

Professor Conwentz groups the monuments of which he treats under seven heads; views, water (especially falls), rocks, such as the Cheddar gorge, the Marlborough Sarsen stones, or erratic boulders, fens, woods, plants, and animals. The three aims to which preservative efforts should be directed are, he says, an inventory and map, actual preservation *in loco*, and the publication of accounts of these monuments. As to the means adopted in various countries to realize these ideals, we have government surveys and maps, voluntary associations for similar purposes, such as our Central Committee for the Survey and Study of British Vegetation, and the work of individuals, such as Hewett Watson. Secondly we have national reservations; a state office, such as that in Prussia of which Herr Conwentz is the head; areas protected by public corporations, such as the London County Council, which controls not only public parks, but also open spaces such as Riddlesdown, and the Corporation of London, with Epping Forest and Burnham Beeches; and voluntary bodies such as our excellent National Trust. There is actual legislation such as our Wild

Birds' Protection Acts, the laws protecting rare plants in Switzerland, and the international agreement of 1900 as to big game in Africa. There are the numerous private societies for influencing public opinion, such as the Audubon Societies in America, our Selborne Society, the Swiss "*Association pour la protection des plantes*" and the Belgian "*Société pour la protection des sites*"; and there are the now numerous county photographic surveys, which, by the by, our author seems to have overlooked.

Professor Conwentz rightly dwells on the great amount already done in this matter by private effort, especially in the United Kingdom, as for example the many handsome presents made to the nation through the National Trust. We are therefore not surprised to find him, although himself the head of a state department, deprecating government action in this matter in Britain. If we do not altogether agree with this conclusion, we none the less feel deeply indebted to the enthusiasm, the industry and the ability of the learned professor for this useful compendium, written, as it is, in faultless English, and concluding complementarily with Shakespeare's question, 'Who is here so vile that will not love his country.'

"Experimental Morphology." By Dr. C. B. Davenport. 8vo., 509 pp. (Macmillan, London, 1908.) 15s. net.

The study of the different forms assumed by plants and animals early attracted great attention; later, the manner of development of these forms was studied; and now attention is being more and more directed towards inquiries into the reasons why organisms develop as they do and what the forces are which direct the path development shall follow. This study of experimental morphology is comparatively new and very much remains yet to be done. The primary aim of the book under review is to give an account of what is known at present concerning the subject in such a manner "as to indicate the directions for further research." Each chapter contains an account of the action of different external conditions upon protoplasm itself or upon that peculiar phenomenon exhibited by protoplasm called growth, and concludes with a list of the principal papers already published dealing with the particular branch of the subject of which it treats. The book abounds with details of experiments upon such subjects as the effect of chemical agents upon protoplasm and upon growth, and the effects of water, density, contact, gravity, electricity and so on, considered in relation to the living stuff itself and in relation to growth. A large proportion of the experiments relate to animals, but all the principal effects upon plants are touched upon.

This edition appears to be an issue of the original two volumes in one but otherwise unchanged. None of the research of the last twelve years is therefore included. It is to be hoped, for the sake of workers now in the field, that a new edition will soon be called for, when the author may increase the indebtedness of fellow-workers to him by bringing his book down to date.

"British Mosses." By the Right Hon. Sir Edward Fry, G.C.B. 2nd ed. 8vo., 72 pp. (Witherby, London, 1908.) 1s. 6d. net.

To those who desire to gain an insight into the structure of mosses and the work they do in the world, this little book can be heartily



recommended, and none who reads it can fail to have his interest awakened by the lucid account of the mosses, "the first mercy of the earth," which it contains. The book is abundantly illustrated and the figures in this second edition are a great improvement upon those of its predecessor.

"An Introduction to Geology." By Prof. W. B. Scott. 2nd. ed. 8vo., 816 pp. (Macmillan, New York, 1907.) 11s. net.

The second edition of this well-known text-book has been thoroughly revised and brought up to date, several of the illustrations, for instance, showing phenomena due to the great San Francisco earthquake of 1906. The plan of the book is to describe first the principal rock-forming minerals; secondly to consider the various forces that have been at work in moulding the crust of the earth, dealing with volcanic agencies and the work of earthquakes, and with those surface changes which will more closely appeal to the garden designer, due to the action of water in its different forms; thirdly, the structure of the rocks themselves is dealt with; then the form of the earth, its mountains and river basins, and so on; finally, an account of the sequence of events in geological time with descriptions of the fossils found in the different strata. The book is written in an interesting style, and profusely and admirably illustrated. The illustrations of geological phenomena are taken from many parts of the earth, though as a book written in America for American students, the majority illustrate parts of the United States. A full index is appended.

"Life Histories of Familiar Plants." By J. J. Ward. 8vo., 204 pp. (Cassell, London, 1908.) 6s.

This is one of the now numerous books upon our native flowering plants, written with the object of interesting the unscientific observer in the common plants of field and forest. It deals in a popular way with the structure of the plants treated upon, and especially with their relation to their environment both animate and inanimate. In endeavouring to find an explanation of the form, arrangement and markings of different parts of plants, the author makes many ingenious suggestions, not all of them very convincing. It is a pity, too, to write as though the plants were sentient beings and are even able to convey messages to others of the species; as when, for instance, the first *Oxalis* found by folding its leaves at night it lost less heat (the suggestion the author makes as the result of the habit), "it forthwith conveyed the hint to the race." This is only one instance of many that occur.

The author ascribes sensitiveness to the root-cap—a structure composed of dead cells! (page 68). He says, too, that the cowslip is a plant of the low meadows, but surely it is also a plant of the hills; the slopes of the Pegsden Hills, for instance, are covered with cowslips, and so is many a railway embankment. His explanation of the difference in habit of flowering between the cowslip and the primrose seems of very doubtful value.

So long as the reader of books of this kind will exercise his critical faculties and will make observations as to the truth of statements for himself no great harm is done, but where children are concerned there is often a danger of imbibing theories as facts and finding it difficult later to correct



them, so fixed do they become on the young mind. One could wish sometimes that authors would realize the impressiveness for many minds that still clings round the printed word, and would therefore, in their popular writings, be chary of advancing theories without carefully testing them from many points of view.

The illustrations, numbering 120, form a feature of the book and are good photographs well reproduced in half-tone. Most of them are worthy of praise, though figure 84 does not show the blotches on the Orchis leaves, which it is said to depict. Figure 93 appears to represent *Sedum spectabile*, not *S. Telephium*, as the name is given in the text.

"The Methods and Scope of Genetics." By W. Bateson, M.A., F.R.S. 8vo., 49 pp. (University Press, Cambridge, 1908.) 1s. 6d. net.

It was a happy idea of Professor Bateson to publish, for the benefit of the general public, the lecture which he delivered before the members of the University of Cambridge on the occasion of his inauguration as Professor of Biology in October last.

The purpose of the lecture is to describe, in a popular manner, the present outlook over the field of experimental research in the physiology of heredity and variation, a study which, owing to Mendel's wonderful discovery, has now developed into the definite and distinct science known as Genetics. As the author says, Mendelian discovery is leading us into a new world, the very existence of which was unsuspected before. He begins by pointing out the simple fact that each individual plant and animal has a double nature owing to its origin from two cells, one maternal and the other paternal. It is curious that the full consequences of this double nature seem to have struck nobody before Mendel. As Professor Bateson says: "In order to understand the significance of Mendelism, we must get thoroughly familiar with the fact that a man, a butterfly, and an apple-tree are not each one thing, but are each two things, double throughout every part of their composition. Consequently the contribution of the maternal and paternal gametes, or 'marrying' cells, may, in respect of any of the ingredients, be either the same or different. If they are the same the regulating organism is pure-bred for that ingredient; if different it is cross-bred."

Recent genetic research has led us to the further important conception that the individual is composed of what we call "presences" and "absences" of all the possible ingredients. This fruitful conception is the basis of all progress in genetic analysis. As to the nature of these ingredients or factors we at present know nothing, but it is interesting to note that Professor Bateson thinks that with the assistance of the physiological chemist, it cannot be very long before we know what some of these factors are.

Professor Bateson next deals with the phenomenon of segregation, and shows that where an individual is cross-bred for a certain ingredient, the germ-cells formed by such an individual alternately either contain or do not contain representatives of that ingredient. In Professor Bateson's own words: "If *both* the parent-gametes brought a certain quality in, then all the daughter-gametes have it. If it came in from one side and not from the other, then on, an average, in half the resulting gametes it will

be present and from half it will be absent. This last phenomenon, which is called segregation, constitutes the essence of Mendel's discovery."

Professor Bateson modestly shows, in passing, how a little experiment of his with Sweet Peas clearly demonstrated the true nature of reversion and variation. Two well-grown dwarf races of Sweet Peas which breed true, the prostrate 'Cupid' and the half-dwarf 'Bush,' crossed together produced the ordinary 'Tall' Sweet Pea of full height. "The reversion occurs because the two factors that made the *height* of the old Sweet Pea again come together after being parted; and the variations by which each of the dwarfs came into existence must have taken place by the dropping out of one of these elements or of the other." Here it may be said that if the study of genetics had done nothing more than this, it would have fully justified its existence, after the many years of vague and futile discussions about reversion and variation since the time of Darwin. It is refreshing to find that a simple experiment with Sweet Peas in Mr. Bateson's garden at Grantchester should help to give us the solution of two profound problems which have exercised the greatest minds in all ages.

In justice to Professor Bateson it seems only fair to point out that though in his writings he modestly ascribes all his results to the work of Mendel, those of us who have had the good fortune to work with him know full well that there is much more than this behind it all. Mendel's work with culinary peas has undoubtedly been the basis of all recent genetic research, but had it not been for Professor Bateson's guiding hand, would the problems of reversion and variation have ever been solved? I think not.

Other interesting advances are noted in Professor Bateson's lecture, such as the presence of preventive factors, of superposed factors, of mutual repulsions and interactions between different factors, to say nothing of some stimulating suggestions on the probable Mendelian inheritance of sex in insects, birds and man. Last, but not least in importance, Professor Bateson alludes to the value of genetic inquiry to the study of evolution and to practical human affairs, and throws out some broad hints to those who are concerned with the problems of the origin of species and the betterment of the human race.

In short this admirable and indispensable little book, written by a master-hand, is essentially a popular work in the truest sense of the word, and must appeal to all sorts and conditions of readers, in spite of its somewhat technical title. It is a book which makes for progress, and a careful study of it is an absolute necessity to those who wish to be up-to-date in the new science.

"Through Southern Mexico: being an Account of the Travels of a Naturalist." By Dr. Hans Gadow. 8vo., 527 pp., 165 illustrations and maps. (Witherby, London, 1908). 18s. net.

This is an interesting record of the author's travels and exploration during some eight months in 1902 and 1904. There are plenty of travel incidents and adventures, which give a very clear and vivid idea of a country which is not often visited by English travellers. The special

value of the book lies perhaps in the many details about the life and customs of frogs, tree-frogs, snakes, lizards, and the like, of which a great number were collected. There is, in particular, a very full history of the classical axolotl.

There is also a chapter on the ancient civilization in Mexico and its origin, which contains full details of the astronomy and calendars of the Aztecs or Toltecs. The customs and characteristics of the modern Indian inhabitants are often mentioned incidentally.

For botanical readers there is a full account of the cultivation of *Agave americana*, and of its use as pulque; such fruits as the Mexican banana, pineapple, alligator pear, mammee apple and the like, are fully described. The forests of Mexico are still by no means so thoroughly known as one would expect, and there are graphic sketches in many parts of the volume which are of interest.

The rain forest is fringed on its outskirts by an impenetrable wall of luxuriant herbage, shrubs and creepers, the *tout ensemble* recalling a lavishly arranged bank of flowers at a flower show. After hacking and slashing a path through the tangled growth, "we are in a gloomy, stuffy forest consisting of tall straight trees, which branch out at a great height above us, there interlacing and forming a dense canopy of green through which passes little or no sunlight." "From below the leaves, branches, and even bright coloured birds look black."

"If by a lucky chance, we obtain a bird's-eye view from some eminence we behold a different world. A dense green carpet overstrewn with thousands of mauve, pink, yellow, or white flowers of some kind of Bignonia, visited by countless butterflies which are preyed upon by lizards and tree-frogs, these being in their turn sought after by tree-snakes. Of bird life, gorgeous and beautiful in colour, there is plenty. Vividly coloured are also many of the other creatures—frogs, snakes, lizards, and butterflies. Colour has to be laid on vividly, quiet coloration being out of place. This colour-contrast was started by the blossoms, red, yellow, or white; self colours not variegated predominate and stand out very effectively against the green."

The very clear description of the Mexican forest does not, however, apply to all tropical forests, which may be exceedingly different even in one and the same district.

The author has also some very interesting notes as to the distribution of plants in the Nevado in which he appreciates the great importance of the cloud zone. There are also many other interesting observations on ants, birds, the Mexican slug, and other animals.

"Notes of a Botanist on the Amazon and Andes." By Richard Spruce, Ph.D. Edited by Alfred Russel Wallace, O.M., F.R.S. 8vo., 2 vols., 518+542 pp. 71 illustrations, 7 maps. (Macmillan, London. 1908.) 21s. net.

These notes form a rather miscellaneous collection made from notebooks, journals and private letters during Spruce's long residence in South America from 1849–1864. But they also include several valuable Papers which were prepared by him for publication and which are to be found in the second volume.



Many of his adventures and experiences are most interesting, for he travelled in many dangerous and out-of-the-way places, and describes, with almost photographic accuracy, the ferocious insects, the flora, the particularly exasperating Indians and other inhabitants.

The scattered references to Orchids, Palms, Ferns, Bromeliads, Melastomaceae and other interesting flowers and trees are often valuable. He was an enthusiastic collector in a botanist's paradise and took every advantage of his opportunities. We must allude also to the full account of the rubber trees, and of the methods of preparation and collection, as well as to his painful and dangerous search for *Cinchona* seedlings and the successful transport of these specimens from their original home to the seaport from which they eventually reached British India, where their descendants are now flourishing. There are valuable accounts also of the narcotics and stimulants in common use amongst the Indians.

His sketch of the vegetation of the Amazon valley is exceedingly clear and compares favourably even with the recent descriptions of Dr. Ula. Indeed one is often apt to forget that these notes are forty years old, and one cannot help wishing that he had worked out several problems of which he evidently knew a great deal more than can be deduced from his rough notes.

The floating-islands of the Amazons, composed of grasses which are sometimes forty-five feet long, seem to resemble similar vegetations from the Nile and the Ganges. He has much of great interest to say also on the different forests in the Amazon's valley, which are very clearly distinguished and described.

There are all sorts of questions connected with anthropology, zoology, geology and meteorology, which are discussed in this work. There is, *e.g.*, a very full history of the Warrior-women or Amazons, of Valverde's still secret treasure-store, and of the picture writing of the Indians which is found etched on rocks at many points in the valley.

But the most interesting part of the volume refers to those ferocious ants which occupy, or perhaps we should say which dominate, the forests of Hylaea. Spruce does not exactly say that they form the ant-gardens by carrying seeds and earth to the forks of the branches, but he alludes to them and very likely did not care to set down what he thought. The Paper on ant-agency, which was written in 1869 and is now published for the first time, is, however, of the greatest scientific importance, and it should be carefully studied by every naturalist.

There is a certain Melastomaceous genus, *Tococa*, of which there are twenty-four or twenty-five species in the Amazons. One or two of these are entirely submerged in the annual inundations, and these have no ant-homes, but all the others, none of which are ever completely covered by the water, possess peculiar sac-like swellings between the vein-forkings. These are inhabited by ferocious ants which form an efficient bodyguard to the plant. So far as these observations go, they simply add to the already long list of ant-guarded plants. But Spruce in his original Paper states that he examined half-grown plants, and saw that the sacs begin to form long before any ants touch them and proceeds to draw the important conclusion that these swellings or sacs are inherited and are the result of long continued generations of ant-visitors.

It is a case very similar to the well-known acarodomatia or mite-homes common in the vein-forkings of the leaves of many British trees. With regard to these it has also been stated that they appear in a rudimentary state before the mites reach them. Readers of this Journal will also recall Professor Henslow's well-known theory that flower nectaries owe their origin to the probing and tearing of insects seeking pollen or honey.

Unfortunately for Spruce, and also for science, it was then supposed that acquired characters could never be inherited, especially if they were of the nature of mutilations.

In consequence, this valuable Paper has been held back for forty years, and it is very likely that Spruce was so discouraged by its reception that he did not work out other interesting points. Dr. Wallace, so far as one can see, believes Spruce's observations to be correct, though without committing himself to the unpopular and heterodox view that acquired characters can be inherited.

The Paper may be taken as a valuable step in advance, for there are many instances, not only that of *Tococa*, of ant-agency.

But it is difficult not to feel disheartened and discouraged when one finds that orthodoxy in scientific matters still has such power to discredit and delay the obvious deductions of an experienced naturalist.

The publication of this valuable Paper in its original form should make this book necessary for the library of all interested in Darwinism.

"Elementary Botany." By E. Drabble, D.Sc., F.L.S. 8vo., 234 pp. 76 figures. (Edward Arnold, London, 1908.) 2s. 6d.

This small text-book of elementary botany has been written for those preparing for examinations requiring but an elementary knowledge of the science, a broad general idea of the fundamental principles in the life of flowering plants, without entering into the minute histological details which entail the use of a microscope. The first 180 pages are devoted to these principles and a simple description of the modifications of the organs of plants, and the student is encouraged to conduct experiments with simple apparatus, taking nothing for granted, but demonstrating for himself the truth of all assertions laid down. About thirty pages are given to a general outline of classification, a summary being given of the broader characteristics of the more important genera in those natural orders which are usually included in an elementary syllabus. The numerous figures are of a somewhat simple character, but sufficiently serve their purpose for illustrating the text. This will prove a very useful little book to put into the hands of a beginner in the study of Botany.

"Roses and Rose Growing." By Rose G. Kingsley. 8vo., 163 pp. (Whittaker, London, 1908.) 6s. net.

Notwithstanding the number of books dealing with Roses and Rose culture which have appeared in recent years, the present volume fills quite a distinct place of its own. For it is written by an amateur of considerable experience, in the interest of that numerous class of Rose growers who, like the writer herself, tend their Roses themselves, and to whom the exhibition tent offers no attractions whatever. Then

again, the directions and descriptions are so clearly and graphically given, and with such enthusiasm, that they cannot fail to interest those who have as yet given but little attention to the subjects of which they treat. The early chapters are devoted to such cultural questions as planting, pruning, propagating, &c., while the greater part of the work deals in an interesting manner with the various classes into which cultivated Roses are divided, and the purposes for which they are best adapted—with lists appended of the principal varieties in each. At the end is a short chapter by the Rev. F. Page-Roberts, President of the National Rose Society, himself an experienced exhibitor, on how to grow Roses for exhibition. In no other part of the volume, however, is the question of Rose-growing treated in any but from a garden point of view. No notice of this Rose book would be complete without special mention of the illustrations, and more particularly the coloured portraits of Roses, which are among the most faithful and pleasing that have yet appeared.

“The Nature of Enzyme Action.” By W. M. Bayliss, D.Sc. F.R.S. 8vo., 90 pp. (Longmans, London, 1908.) 3s. net.

A highly technical monograph on a section of Biochemistry. It is based upon lectures given at various times in University College, London. The general properties more or less common to enzymes are discussed in such a manner that only the earnest and somewhat advanced student can sufficiently appreciate.

A long list of literature which has more or less direct bearing on the subject, and which is to some extent referred to in the text, is given at the end. There is also a good index.

“Soils and Fertilizers.” By H. Snyder. 3rd ed. 350 pp. (Macmillan, New York and London, 1908.) 5s. net.

A very useful book by a well-known and painstaking author. Beginning with the physical properties of soils, it proceeds to deal with their formation, classification and chemical composition. Soil nitrogen takes up some forty pages. Organic manures and the various fertilizers are dealt with in a style which most readers will duly appreciate. Food requirements and rotation of crops receive careful attention. Tillage operations are enlarged upon in a manner which shows a master's hand, and the reader will probably wish this section was more detailed. The work contains a chapter on Laboratory practice.

“The Soil: an Introduction to the Scientific Study of the growth of crops.” By A. D. Hall, M.A. 2nd ed. 311 pp. (Murray, London, 1908.) 5s. net.

A second edition of a well-known book, and one recommended by the R.H.S. for students. There are several additions and alterations in this edition. The author states he has greatly modified the views he expressed in the first edition on the nature of clay and on the part played by zeolitic silicates in the retention of ammonium and other salts by the soil. He draws attention to the great additions made to our knowledge of the work of bacteria in the soil and the information has accordingly been brought much more up-to-date in this respect.



The author writes as a scientist and as a teacher, and he is both these of the first water, but he falls into one very serious error. He writes: "There is every probability that the individual farmer will be as often misled as guided by the results of his own experiments. The design and conduct of field experiments must be left to the expert." He will find few to agree with him.

"The Standard Cyclopedia of Modern Agriculture and Rural Economy." By many Authors; edited by Professor R. Patrick Wright. 8vo., vols I. and II. each 240 pp. and many plates and figures. (The Gresham Publishing Company, London, 1908.) 8s. net each vol.

This work, which is to be completed in 12 vols., aims at being an exhaustive treatise on all that appertains to Agriculture, including Horticulture. The contributors are for the most part the best recognized authorities on the subjects dealt with. It would be a bold critic who could venture to question the soundness of the majority of the articles, although before the publication of the entire work is completed we doubt not some of the statements will have been proved to be exploded errors.

Vol. I. contains a very valuable anatomical model of the cow.

The subjects dealt with are so diverse that without an index it is difficult to find what one requires. Even then the matter is much broken up, probably necessarily so for alphabetical arrangement. The value of the work will very greatly depend upon the index.

"Gardens of England." Painted by Beatrice Parsons, and described by E. T. Cook. 8vo., 199 pp. (Black, London, 1908.) 7s. 6d.

A charmingly written and beautifully printed and illustrated book which we think would be of more value if an index were appended. About twenty garden scenes are well illustrated in colours, and as in many places similar effects could easily be produced, this work will commend itself to owners of large gardens who may be contemplating alterations or improvements, or making new gardens. The descriptive matter relating to the illustrations contains a mass of information on how and when to plant the various plants figured, and many excellent suggestions are given on desirable plants to grow.

"English Houses and Gardens in the seventeenth and eighteenth centuries." Reproduced from contemporary engravings by Kip, Badeslade, Harris, and others. Obl. 4to., 36 pp. 61 plates. (Batsford, London, 1908.) 15s. net.

This is not only a most interesting book, but its quaint plates are very instructive in showing the strictly formal style of gardening in vogue during the period mentioned in the title. There are sixty-one plates showing many well-known noblemen's and gentlemen's seats: few if any of them would be recognized at the present day. A more natural and beautiful type of gardening has replaced the original stiff plans, but in some of the places mentioned and illustrated that we have visited, there are still the magnificent avenues planted in those days, giving an appearance which excites the envy and admiration of all who do not possess such a noble feature on their own estates. Almost all the build-

ings and gardens depicted in the plates were made between the years 1550 and 1720; symmetry of design being the prevailing feature of the house, buildings and gardens, and one cannot fail to admire the exceeding care to have everything exactly balanced. Clipped hedges, parterres with box edging, and bowling greens, are much in evidence in some of the engravings, and terraces are seen in almost all, proving that expense was not spared. The book is of a convenient size, well-printed, pleasingly bound. The pages are not all numbered, but the plates are, and are easily found.

"Mushrooms. How to grow them." By William Falconer. 8vo., 169 pp. (Kegan Paul, London, 1907.) 5s.

Although this work was written in America for American readers principally, there is much that is of interest and value to European readers, in fact, many extracts are from books and papers published in Britain on mushroom culture. While endorsing nearly all the information and advice so ably put before us, we must disagree with the author when he says "that the manure from carrot-fed horses is good, and anyone having plenty of it can also have plenty of mushrooms." He freely admits that it is not so good as manure from horses not root fed; and our experience, and that of many others who have grown mushrooms, is that no satisfactory crop of mushrooms can be grown from manure where the horses are daily supplied with roots or where they are physicked to keep them in condition. With the above exception we cordially agree with all the practical author has written, and can recommend the book to all interested in mushroom cultivation. The work is well printed, nicely illustrated, and well bound.

"Children and Gardens." By Gertrude Jekyll. 8vo. 110 pp. (Country Life, London, 1908.) 6s. net.

A charmingly written book with beautiful illustrations, and with the innumerable books on gardening there is still room for this. Nothing is better for children than gardening, and the authoress tells how the love of gardening may be fostered amongst children from her own experience. Many children have been given pieces of barren or rough ground to make a garden, and the work has become so irksome that in a short time they have detested it, and cared very little about a garden ever after, but given a nice little garden already made, the conditions are totally different. All this and much more is fully treated upon by the author, and is well worth reading by all who have children and a garden. The only thing we object to in the book is the praise accorded to cats in the garden; they are nearly as bad as the proverbial bull in a china shop, doing almost as much damage.

## BRUSSELS SPROUTS AT WISLEY, 1908-09.

THIRTY-TWO stocks of Brussels Sprouts were received for trial, all of which, except those received late, were sown on March 21. When large enough the plants were put out at 3 feet apart each way, on land that had been deeply dug and moderately manured. All germinated well, and made excellent growth, but the very hot weather in October caused nearly all the "buttons" to become open and loose. Mild weather generally continued to the end of December 1908, when severe weather suddenly set in, the thermometer falling to zero, practically destroying the whole crop.

## LIST OF VARIETIES.\*

- |                              |                              |
|------------------------------|------------------------------|
| 1. Covent Garden Favourite.  | 17. Scrymger's Giant.        |
| 2. De la Halle.              | 18. Half-dwarf Paris Market. |
| 3. French Dwarf Improved.    | 19. Dwarf Gem.               |
| 4. French Solid Sprout.      | 20. Exhibition.              |
| 5. Improved Erfurt.          | 21. Standard.                |
| 6. Little Gem.               | 22. Exhibition.              |
| 7. Paris Market.             | 23. Darlington.              |
| 8. Perfection.               | 24. Selected.                |
| 9. President Carnot.         | 25. Model.                   |
| 10. Scrymger's Giant.        | 26. Little Gem.              |
| 11. Semi-dwarf Dutch.        | 27. Skrobeck Favourite.      |
| 12. Standard.                | 28. One and All.             |
| 13. Tall Improved.           | 29. St. Martha.              |
| 14. The Wroxton.             | 30. Danish Prize.            |
| 15. Cambridgeshire Champion. | 31. Eiffel Tower.            |
| 16. Paris Market.            | 32. Superlative.             |

15. Cambridgeshire Champion (J. Veitch).—Stock not fixed, and requires further selection.

1. Covent Garden Favourite (Barr).—Growth moderate, irregular in habit; medium-sized foliage; sprouts large and firm. Stock requires a little more selection.

30. Danish Prize (Burpee).—A very tall grower with large foliage; sprouts small, open, and grown out.

23. Darlington (Kent & Brydon).—Growth dwarf, compact; moderate foliage; sprouts large, firm, and stood well. One of the best.

2. De la Halle (Barr).—Growth moderate; even habit; medium foliage; sprouts large, firm, loosely placed. A very late variety.

\* All trials in the Wisley Garden are carried out under number only until judging is completed. The number prefixed to the name of the variety in the Report corresponds with that by which alone the variety was known until judgment had been given. Fellows visiting the Garden and noticing any plant under a number can easily ascertain its name later by reference to the Report in the JOURNAL.



19. Dwarf Gem (Sutton).—Growth dwarf, habit compact; foliage small; sprouts small and firm. This variety occupies less space than other varieties.

31. Eiffel Tower (Gray).—A very tall, robust grower, and requires further selection.

20, 22. Exhibition (Sutton, Sharpe).—Moderate grower, good habit; foliage rather large; sprouts large and fairly firm.

3. French Dwarf Improved (Barr).—Growth very dwarf; even, compact habit; foliage medium and in a thick cluster on the head; sprouts small and thickly placed. A good variety.

4. French Solid Sprout (Barr).—Growth tall and irregular; foliage large; sprouts small and thinly placed, quickly become loose.

18. Half-Dwarf Paris Market (Vilmorin).—Growth dwarf; moderate foliage; sprouts small, very firm; kept in good condition longer than other varieties.

5. Improved Erfurt (Barr).—Growth dwarf, habit compact; small foliage; sprouts small and poor; rotted quickly.

6, 26. Little Gem (Barr, Sydenham).—Growth dwarf, good habit; moderate foliage; sprouts very small, but firm and standing fairly well.

25. Model (Bunyard).—A very tall grower, and not a success at Wisley.

28. One and All (Heinemann).—Requires further selection.

7, 16. Paris Market (J. Veitch, Barr).—Medium growth; foliage very dark and distinct; habit regular and compact; sprouts small, clean, and firm.

8. Perfection (Barr).—Growth dwarf, but sprouts too poor for description.

9. President Carnot (Barr).—Growth moderate, fairly compact; foliage of medium size; sprouts large and firm.

10, 17. Scrymger's Giant (Barr, J. Veitch).—Growth rather large; habit regular; sprouts large, but loose, and suffered severely from frost.

24. Selected (Dobbie).—Growth tall and robust; moderate foliage regular; sprouts large, but grew out quickly.

11. Semi-dwarf Dutch (Barr).—Growth dwarf; foliage and habit very compact; sprouts so very small as not to be worth describing.

27. Skrobeck Favourite (Johnson).—Growth moderate; good compact habit and foliage; sprouts small, and grew out quickly.

12, 21. Standard (Barr, Sharpe).—Growth tall; good regular habit; foliage moderate; sprouts loose and open.

29. St. Martha (Staward).—Stock mixed.

32. Superlative (Wallace).—Stock not fixed; red foliage.

13. Tall Imported (Barr).—Tall, straggling grower, and requires more selection.

14. The Wroxton (Barr).—Growth dwarf, compact, sturdy; foliage moderate; sprouts of medium size, firm. A good late variety.

## PARSLEY AT WISLEY, 1908-09.

THIRTY-SEVEN stocks of Parsley were received for trial, all of which were sown on April 2, on soil that had been deeply dug and well manured, the rows being 18 inches apart, and the plants thinned out later to one foot apart in the rows. All the stocks germinated well, and the growth made was excellent. All the stocks stood the trying winter very well, Nos. 3, 4, 5, 11, and 32 standing particularly well. The Fruit and Vegetable Committee examined the collection on two occasions.

## LIST OF VARIETIES.\*

- |                               |                                    |
|-------------------------------|------------------------------------|
| 1. Beauty of the Parterre.    | 20. Exhibition.                    |
| 2. Champion Moss-curled.      | 21. Fern-leaved.                   |
| 3. Covent Garden.             | 22. Fern-leaved.                   |
| 4. Crested Bouquet.           | 23. Hamburgh or Turnip-rooted.     |
| 5. Dwarf Perfection.          | 24. Myatt's Extra-fine Garnishing. |
| 6. Emerald Green.             | 25. Perennial.                     |
| 7. Extra Double-curled.       | 26. Perfection Moss-curled.        |
| 8. Fern-leaved.               | 27. Exhibition.                    |
| 9. Giant Curled.              | 28. Perfection.                    |
| 10. Large Curled.             | 29. Moss-Curled.                   |
| 11. Myatt's Garnishing.       | 30. Mossy-curled.                  |
| 12. Perpetual.                | 31. Brookland's Exhibition.        |
| 13. Plain or Sheep's Parsley. | 32. Exquisite curled.              |
| 14. Triple Curled.            | 33. Dwarf Perfection.              |
| 15. Myatt's Garnishing.       | 34. Extra Curled.                  |
| 16. Imperial Curled.          | 35. Champion Moss-curled.          |
| 17. Garnishing.               | 36. Fern-leaved.                   |
| 18. Dwarf Perfection.         | 37. Extra Curled.                  |
| 19. Champion Moss-curled.     |                                    |

**F.C.C.** = First-class Certificate.

**A.M.** = Award of Merit.

1. Beauty of the Parterre, **A.M.** August 25, 1908 (Carter).—Growth tall, strong, and vigorous; leaves large, branched, and well curled.

31. Brookland's Exhibition (Deal).—Very similar to No. 1, but the leaves not so branching.

2, 19, 35. Champion Moss-curled (Dobbie, Carter, Vilmorin).—Growth tall, strong, vigorous; leaves large, branched, beautifully curled; very dark green colour.

3. Covent Garden, **F.C.C.** August 30, 1870 (Carter).—Growth flattish and very spreading, vigorous; fronds large, branched, well curled; pale green in colour.

4. Crested Bouquet (Carter).—Growth rather tall and spreading; leaves much branched, densely curled; light green in colour.

\* See footnote p. 88.

5, 18, 33. Dwarf Perfection, **A.M.** July 31, 1908 (Sutton, Carter, Massey).—Growth dwarf, vigorous, spreading; leaves branched and tightly curled. A beautiful variety for garnishing.

6. Emerald Green, **A.M.** August 25, 1908 (Carter).—A densely curled form of No. 3.

20, 27. Exhibition (Bunyard, Dobbie).—Growth rather tall, compact; leaves of medium size, well curled; dark green colour.

32. Exquisite Curled (Kent & Brydon).—Growth tall, vigorous, spreading; leaves branched and semi-fern-leaved.

34, 37. Extra Curled (Staward, Harris).—Growth dwarf and compact, strong; leaves of medium size and well curled.

7. Extra Double-curved, **A.M.** August 25, 1908 (Carter).—A good form of No. 3.

8, 21, 22, 36. Fern-leaved (Barr, Carter, Dobbie, Vilmorin).—Growth tall, vigorous, branching, fern-like; light green colour.

17. Garnishing, **A.M.** August 25, 1908 (Sutton).—Growth tall and vigorous; leaves much divided, almost like Fennel; light green, very distinct.

9. Giant Curled (Carter).—Growth tall and vigorous; large spreading leaves, moderately curled.

23. Hamburgh or Turnip-rooted (Barr).—This is best known as "Sheep's Parsley," and is largely grown in Australia for sheep, as it is very productive, but of little value for garden purposes.

16. Imperial Curled (Sutton).—A vigorous form of No. 15.

10. Large Curled Branching (Carter).—Very similar to No. 15.

29. Moss-curved, **A.M.** August 25, 1908 (Nutting).—Growth rather tall and branching, vigorous; leaves large and well curled; light green colour.

30. Mossy Curled (Sydenham).—Growth medium, branching, vigorous, nicely curled; darkish green.

11, 15. Myatt's Garnishing (J. Veitch, Carter).—Growth rather tall, vigorous, branching; leaves large and moderately curled; rather light green.

24. Myatt's Extra-fine Garnishing, **A.M.** August 25, 1908 (Barr).—A very fine and beautifully curled form of No. 15.

25. Perennial (Barr).—A very good well-curved variety, but requires more selection.

28. Perfection, **A.M.** August 25, 1908 (Johnson).—Growth rather dwarf, branching, vigorous, and yet compact; close fern-leaved; pale green, handsome.

26. Perfection Moss-curved (Barr).—Growth tall and straggling, coarse, and not well curled.

12. Perpetual (Carter).—Growth dwarf, compact; leaves well curled. Requires a little more selection.

13. Plain or Sheep's Parsley (Carter).—See 'Hamburgh.'

14. Triple Curled (J. Veitch).—Growth moderate, branching, vigorous; leaves fairly well curled; pale green.



## EXAMINATION OF EMPLOYEES IN PUBLIC PARKS.

JANUARY 11th, 1909.

THE Royal Horticultural Society's fourth Examination of the Employees in Public Parks was held on January 11, 1909.

As previously, the Examination was partly *viva voce* and partly written, occupying three hours and twenty minutes. It was held at the Society's Hall in Vincent Square, Westminster.

One hundred and nineteen candidates entered, and of these twenty-five secured places in the first class, forty in the second, and thirty-seven in the third, leaving seventeen candidates who failed to obtain the minimum marks required. No one candidate stands out prominently before the others, and the highest marks obtained fall considerably below those of 1908. It is encouraging, however, to notice that in Class I about fifty per cent. of the candidates were in the lower Classes last year, and other candidates of former years, if not yet in Class I, have attained a higher position than formerly. So much for the value of perseverance.

The answers to the questions indicated a very fair acquaintance with the practical work of draining, trenching, manuring, soil preparation for planting, and the general cultivation of the soil. It is on questions involving thoughtful study, observation and resource that many candidates show much weakness. To attain a certain versatility of ability to deal with all aspects of the work of a public garden is a matter requiring thought and observation. The lack of these was evident in answers to Questions 5 and 13. The former merely required the expression of a few graceful curves—but many of the answers revealed the crudest lines and most inartistic ideas; and the few attempts made to answer Question 13 may be supposed to indicate a lack of knowledge of the financial side of a public garden. A marvellous deficiency in arithmetic was exposed, only four correct answers being given to '13 (3)' which any boy in Standard IV at school might easily have answered. With reference to the classification and naming of trees and shrubs, the majority of the candidates were familiar with the common name of many, but were unable to give their generic or specific names. Their native countries also were but weakly known, and as to those which are distinctly 'British' a general haziness of mind existed, the majority of candidates including N. American, Japanese, and New Zealand trees and shrubs as British. The scientific names and the natural habitat of the trees and shrubs of our public gardens would repay a closer study, for nothing interests the public more than to find these points well and correctly set out.

An immense improvement is noticed in the understanding of the cultivation of flowering shrubs, indicated by the answers to Question 12, as compared with two years ago, when a similar question was given.

Reviewing the results generally:—There is still much room for improvement, the higher standard hoped for in last year's report having

to be still held in anticipation. A completer knowledge of garden practice and the reasons for it ; the values of phosphatic and nitrogenous manures, their comparative cost, and the quantities required ; the art of curves and the power to express them neatly on paper ; arithmetical calculations for land measures and simple cash computations—such things as these, added to a more intensive knowledge of gardening specialized for public parks, are necessary to raise the employees to the standard of really first-class craftsmen whose skill is to find expression in the gardens which they serve.

The higher places gained by most of the old candidates in the lists should be an encouragement to the less successful to persevere diligently with their work and try again next year.

It should perhaps be put on record that there is absolutely no difference of merit whatsoever in being placed in Division A or in Division B. A first Class in one is as good as a first Class in the other. The two Divisions are only kept up for the convenience of certain public authorities.

|                |                     |
|----------------|---------------------|
| C. R. FIELDER, | } <i>Examiners.</i> |
| OWEN THOMAS,   |                     |
| JOHN W. ODELL, |                     |
| W. CRUMP,      |                     |
| EDWARD WHITE,  |                     |
| W. WILKS,      |                     |

## DIVISION A.

### *Class I.*

1. Gibson, E., Clissold Park Lodge.
2. Western, Jos., Island Gardens, Poplar.
3. Pogmore, C., 7 Anerley Vale, Upper Norwood.
4. Parish, Henry Geo., 39 Canterbury Grove, West Norwood.

### *Class II.*

1. Brice, John Gordon, 14 Constantine Road, Hampstead.
2. Drage, Edward, Harford Street, Mile End.
3. Marshall, Charles, Avery Hill, Eltham.
4. Hodge, William Albert, White Lodge, Victoria Park.
5. Faulkner, Frank, 54 Hargrave Park, Upper Holloway.
6. Philpott, Ernest Victor, 59A Emu Road, Battersea.

### *Class III.*

1. Hurley, James, 141 Trundley's Road, Deptford.
2. Collop, Thomas, 29 Saltwood Grove, Walworth.
3. Scrase, Edward, 68 Idmiston Road, Stratford.
4. Chapman, John, 41 Finland Road, Brockley.
5. Lambourne, C., 72 Clive Road, Dulwich, S.E.
6. Gray, William John, 24 New Church Road, Camberwell.

## DIVISION B.

*Class I.*

1. Mayhew, Charles Watts, 11 Claribel Road, N. Brixton.
2. Butcher, Percy George, 2 Luxford Street, Rotherhithe.
3. Troke, Andrew J., 7 Crewys Road, Child's Hill.
4. Free, M., 5 Mortlake Terrace, Kew.
5. Dixon, Frederick Charles, 2 Hawthorn Grove, New Eltham.
6. Waldon, W., 172 Belgrave Road, Walthamstow.
7. Hartless, Alfred Jas., 40 Bismarck Road, Highgate Hill.
8. Harding, Cyril, 10 Fair Oak Road, Cathays, Cardiff.
9. Poate, H. J., 22 Terront Road, West Green, Tottenham.
10. { Kett, Robert, 87 Ashleigh Road, Mortlake.  
{ Oliver, G. H., 5 Mortlake Terrace, Kew.
12. { Lambert, Thomas, 4 Christie Road, South Hackney.  
{ Jennings, H. C., 66 Sharlestone Road, West Norwood.
14. { Richardson, John, 21 Alexandra Road, Richmond.  
{ Butler, H., 6 Brettenham Road, Walthamstow.
16. { Richards, William Jno. J., 125 Rotherhithe New Road, Rotherhithe.  
{ Middlemiss, Thos. Jas., 51 Clement's Road, Bermondsey.  
{ Wiley, Henry Alfred, 67 Granleigh Road, Leytonstone, E.
19. { Lewis, J. W., 10 Dairsie Road, Eltham.  
{ Newton, Walter E., 307 Southwark Park Road, Bermondsey.
21. Avery, J. W., 15 Pevensey Road, Tooting.

*Class II.*

1. Webb, Herbert Wm., 49 Vespan Road, Shepherd's Bush.
2. Beale, Jas. H., 2 Watcombe Cottages, Kew.
3. { Scott, John, 36 Alexandra Road, Richmond.  
{ White, James C., 11 Cornflower Terrace, East Dulwich.
5. { Coffey, Daniel James, 6 Halons Road, Eltham.  
{ Oldham, C. H., 35 Gloucester Road, Kew.
7. { Fisher, Walter, 3 Shafton Road, South Hackney.  
{ Ottaway, G., 128 Dartmouth Park Hill, N.  
{ Weston, Robert Jas., 11 Finland Road, Brockley.
10. Barrance, Francis, 3 Glen Cottage, Eltham.
11. { Ringe, James, 5A Winders Road, Battersea.  
{ Barrett, Frederick Wm., 10 Oaksford Avenue, Sydenham.
13. Chamberlain, Arthur G., 22 Fair Oak Road, Cathays, Cardiff.
14. Walkden, Chas. Henry, 14 Heather Road, Grove Park.
15. { Chipperfield, Alfred, 1 Moreton Terrace, Rotherhithe.  
{ Money, E. G., 6 Oxford Road, Upper Norwood.
17. Prow, Chas. Wm., 8 Clandon Street, St. Johns.
18. { McKinley, D. F., 342 Kew Road, Kew.  
{ Anderson, James, 22 Carnac Street, West Norwood.
20. { Headington, W. G., 40 Bullen Street, Battersea.  
{ Salway, Walter Morris, 60 Lulot Road, Highgate.
22. Thompson, A. W., Golder's Hill, Hampstead.



- 23. { Morris, Albert E., 68 Coventry Street, Bethnal Green.
- 23. { Eeles, Frank, 18 Regent Street, Blackheath Hill.
- 25. { White, Henry Geo., 8 Albion Gardens, Hammersmith.
- 26. { Martin, Edward, Crescent Road, New Barnet.
- 26. { Hall, William Geo., 102 Sewardstone Road, Bethnal Green.
- 26. { Bland, William, 7 Holmesdale Road, Highgate.
- 26. { Syms, Henry Wm., Copper Mill Gate House, Walthamstow.
- 28. { Cosham, Chas. I., 13 Brailsford Road, Tulse Hill.
- 28. { Lee, Wm. Robert, 35 Davisville Road, Shepherd's Bush.
- 28. { Vyse, John William, 2 Coombe Road, Upper Sydenham.
- 33. { Wicks, Edwin Frank, 47 Paulet Road, Camberwell.
- 34. { Wilson, Edward James, Waterlow Park, Highgate.

*Class III.*

- 1. Hurrell, Jim, 16 Jubilee Cottages, Eltham.
- 2. Sirett, Frederick W. G., 13F Peabody Buildings, Herne Hill.
- 3. Love, Fredk. Chas., 11 Fergusson Road, East Barnet.
- 4. Featherstone, Ernest, 62 Strahan Road, Bow.
- 5. { MacConachie, Jos. S., 2A Seawen Road, Deptford.
- 5. { Power, W., 152 Old Ford Road, Victoria Park.
- 5. { Salvage, Bertram H., 308 Kew Road, Kew.
- 8. { Williams, Fredk., 11 Royal Street, Lambeth.
- 8. { Holder, Philip E., 49 Durham Road, West Green.
- 8. { Andrews, Samuel, 110 Dartmouth Park Hill, Highgate.
- 11. { Duncan, Geo., 31 Rowland Grove, Upper Sydenham.
- 11. { Ashmore, Sydney, 30 Balham Road, Lower Edmonton.
- 13. { Knowles, Frank H., 8 Albion Gardens, Hammersmith.
- 13. { Smith, Robert, 42 Dumont Road, Stoke Newington.
- 15. White, Wm. Jas., 56 Branksome Road, Brixton.
- 15. { Ottley, Geo., 103 Cheddington Road, Upper Edmonton.
- 16. { Allen, Thos., 17 Ruskin Street, Battersea.
- 16. { Butler, Edwin Arthur, 57 Sewardstone Road, Bethnal Green.
- 16. { Bennett, Frank, 116 Beresford Road, Harringay.
- 19. { Musk, W., 11 Lavers Road, Stoke Newington.
- 19. { Easter, Geo., 14 Highbury Terrace, Highbury.
- 22. { Monkelow, F., 4 Power Street, Battersea.
- 22. { Jones, Edward, 120A Wycliffe Road, Lavender Hill.
- 22. { Cole, Chas., 89 Candahar Road, Battersea.
- 26. { Peck, Chas. R. Y., 2 Bengeworth Road, Camberwell.
- 26. Copeland, J. H., 223 Underhill Road, East Dulwich.
- 27. Morley, Alfred, 41 Birstall Road, South Tottenham.
- 28. { Jepps, John, 128 Dartmouth Park Hill, Upper Holloway.
- 28. { Maythorn, R. F., 8 Christie Road, South Hackney.
- 30. Herne, Henry, 171 Railton Road, Herne Hill.
- 31. Vale, Joseph, 62 Dumont Road, Stoke Newington.

NOTES ON RECENT RESEARCH  
AND  
SHORT ABSTRACTS FROM CURRENT PERIODICAL  
LITERATURE, BRITISH AND FOREIGN,  
AFFECTING  
HORTICULTURE & HORTICULTURAL SCIENCE.

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JUDGING by the number of appreciative letters received, the endeavour commenced in volume xxvi. to enlarge the usefulness of the Society's Journal, by giving an abstract of current Horticultural periodical literature, has met with success. It has certainly entailed vastly more labour than was anticipated, and should therefore make the Fellows' thanks to those who have helped in the work all the more hearty.

There are still, we feel, some departments of Horticulture and Horticultural Science very imperfectly represented in these abstracts, and the Editor would be grateful if any who have time at command, and who are willing to help in any special direction in this work, would communicate with him. He desires to express his most grateful thanks to all who co-operate in the work, and he ventures to express the hope that they will all strictly adhere to the general order and scheme of working, as the observance of an identical *order* can alone enable the Editor to continue to cope with the work. The order agreed on is as follows :—

1. To place first the name of the plant, disease, pest, &c., being noticed ; and in this, the prominent governing or index word should always have precedence.

2. To place next the name, when given, of the author of the original article.

3. Then, the abbreviated form of the name of the journal, &c., in which the original article appears, taking care to use the abbreviation which will be found on pp. 264, 265.

4. After this, a reference to the number, date, and page of the journal in question.

5. If an illustration be given, to note the fact next, as "fig.," "tab.," or "plate."

6. After these preliminary necessities for making reference to the original possible for the reader, the abstract or digest should follow, ending up with the initials of the contributor affixed at the close of each Abstract or Note.

NAMES OF THOSE WHO HAVE KINDLY CONSENTED TO HELP  
IN THIS WORK.

Baker, F. J., A.R.C.S., F.R.H.S.  
 Boulger, Professor G. S., F.L.S., F.R.H.S.  
 Bowles, E. A., M.A., F.L.S., F.E.S., F.R.H.S.  
 Chapman, H., F.R.H.S.  
 Chittenden, F. J., F.L.S., F.R.H.S.  
 Cook, E. T., F.R.H.S.  
 Cooke, M. C., M.A., LL.D., A.L.S., F.R.H.S., V.M.H.  
 Cotton, A. D., F.L.S.  
 Darlington, H. R., F.R.H.S.  
 Druery, C. T., V.M.H., F.L.S., F.R.H.S.  
 Dykes, W. R., M.A., F.R.H.S.  
 Farmer, Professor J. B., M.A., D.Sc., F.R.H.S.  
 Goldring, W., F.R.H.S.  
 Groom, Professor Percy, M.A., D.Sc., F.L.S., F.R.H.S.  
 Hartog, Professor Marcus, D.Sc., M.A., F.L.S., F.R.H.S.  
 Henslow, Rev. Professor Geo., M.A., F.L.S., F.R.H.S., V.M.H.  
 Hodgson, M. L., F.R.H.S.  
 Hooper, Cecil H., M.R.A.C., F.R.H.S.  
 Houston, D., F.L.S., F.R.H.S.  
 Kent, A. H., A.L.S., F.R.H.S.  
 Long, C. H., F.R.H.S.  
 Massee, Geo., F.L.S., F.R.H.S., V.M.H.  
 Newstead, R., A.L.S., F.E.S., F.R.H.S.  
 Petts, Alger, F.R.H.S.  
 Rendle, A. B., M.A., D.Sc., F.L.S., F.R.S., F.R.H.S.  
 Reuthe, G., F.R.H.S.  
 Saunders, Geo. S., F.L.S., F.E.S., F.R.H.S.  
 Scott-Elliot, G. F., M.A., B.Sc., F.L.S., F.R.H.S., F.R.G.S.  
 Smith, William G., B.Sc., Ph.D., F.R.H.S.  
 Veitch, Harry J., F.L.S., F.Z.S., F.R.H.S.  
 Voss, W. A., F.C.S., F.R.H.S.  
 Webster, A. D., F.R.H.S.  
 Welby, F. A., F.R.H.S.  
 Williams, S. E., F.R.H.S.  
 Wilson, Gurney, F.L.S., F.R.H.S.



## JOURNALS, BULLETINS, AND REPORTS

from which Abstracts are made, with the abbreviations used for their titles.

| Journals, &c.                                                          | Abbreviated title.             |
|------------------------------------------------------------------------|--------------------------------|
| Agricultural Gazette of New South Wales . . . . .                      | Agr. Gaz. N.S.W.               |
| Agricult. Journal, Cape of Good Hope . . . . .                         | Agr. Jour. Cape G.H.           |
| Annales Agronomiques . . . . .                                         | Ann. Ag.                       |
| Annales de la Soc. d'Hort. et d'Hist. Naturelle de l'Hérault . . . . . | Ann. Soc. Hé.                  |
| Annales de la Soc. Nantaise des Amis de l'Hort. . . . .                | Ann. Soc. Nant. des Amis Hort. |
| Annales des Sciences Naturelles . . . . .                              | Ann. Sc. Nat.                  |
| Annales du Jard. Bot. de Buitenzorg . . . . .                          | Ann. Jard. Bot. Buit.          |
| Annals of Botany . . . . .                                             | Ann. Bot.                      |
| Beiheft zum Botanischen Centralblatt . . . . .                         | Beih. Bot. Cent.               |
| Boletim da Real Sociedade Nacional de Horticultura . . . . .           | Bol. R. Soc. Nac. Hort.        |
| Boletim da Sociedade Broteriana . . . . .                              | Bol. Soc. Brot.                |
| Botanical Gazette . . . . .                                            | Bot. Gaz.                      |
| Botanical Magazine . . . . .                                           | Bot. Mag.                      |
| Bulletin de la Société Botanique de France . . . . .                   | Bull. Soc. Bot. Fr.            |
| Bulletin de la Soc. Hort. de Loiret . . . . .                          | Bull. Soc. Hort. Loiret.       |
| Bulletin de la Soc. Mycologique de France . . . . .                    | Bull. Soc. Myc. Fr.            |
| Bulletin Department of Agricult. Brisbane . . . . .                    | Bull. Dep. Agr. Bris.          |
| Bulletin Department of Agricult. Melbourne . . . . .                   | Bull. Dep. Agr. Melb.          |
| Bulletin of the Botanical Department, Jamaica . . . . .                | Bull. Bot. Dep. Jam.           |
| Bulletin of Bot. Dep. Trinidad . . . . .                               | Bull. Bot. Dep. Trin.          |
| Bulletino della R. Società Toscana d'Orticoltura . . . . .             | Bull. R. Soc. Tosc. Ort.       |
| Canadian Reports, Guelph and Ontario Stations . . . . .                | Can. Rep. G. & O. Stat.        |
| Centralblatt für Bacteriologie . . . . .                               | Cent. f. Bact.                 |
| Chronique Orchidéeenne . . . . .                                       | Chron. Orch.                   |
| Comptes Rendus . . . . .                                               | Comp. Rend.                    |
| Department of Agriculture, Victoria . . . . .                          | Dep. Agr. Vict.                |
| Department of Agriculture Reports, New Zealand . . . . .               | Dep. Agr. N.Z.                 |
| Dictionnaire Iconographique des Orchidées . . . . .                    | Dict. Icon. Orch.              |
| Die Gartenwelt . . . . .                                               | Die Gart.                      |
| Engler's Botanische Jahrbücher . . . . .                               | Eng. Bot. Jah.                 |
| Gardeners' Chronicle . . . . .                                         | Gard. Chron.                   |
| Gardeners' Magazine . . . . .                                          | Gard. Mag.                     |
| Gartenflora . . . . .                                                  | Gartenflora.                   |
| Journal de la Société Nationale d'Horticulture de France . . . . .     | Jour. Soc. Nat. Hort. Fr.      |
| Journal Dep. Agricult. Victoria . . . . .                              | Jour. Dep. Agr. Vict.          |
| Journal Imperial Department Agriculture, West Indies . . . . .         | Jour. Imp. Dep. Agr. W.I.      |
| Journal of Botany . . . . .                                            | Jour. Bot.                     |
| Journal of Chemical Society . . . . .                                  | Jour. Chem. Soc.               |
| Journal of Economic Biology . . . . .                                  | Jour. Econ. Biol.              |
| Journal of Economic Entomology . . . . .                               | Jour. Econ. Entom.             |
| Journal of Horticulture . . . . .                                      | Jour. Hort.                    |
| Journal of the Board of Agriculture . . . . .                          | Jour. Bd. Agr.                 |
| Journal of the Linnean Society . . . . .                               | Jour. Linn. Soc.               |
| Journal of the Royal Agricultural Society . . . . .                    | Jour. R.A.S.                   |
| Journal S.E. Agricultural College, Wye . . . . .                       | Jour. S.E. Agr. Coll.          |
| Kaiserliche Gesundheitsamte . . . . .                                  | Kais. Ges.                     |
| Le Jardin . . . . .                                                    | Le Jard.                       |
| Lebensgeschichte der Blütenpflanzen Mitteleuropas . . . . .            | Lebens. d. Blütenpfl.          |
| Naturwiss. Zeitschrift Land und Forst . . . . .                        | Nat. Zeit. Land-Forst.         |
| Notizblatt des Königl. Bot. Gart. und Museums zu Berlin . . . . .      | Not. König. Bot. Berlin.       |
| Orchid Review . . . . .                                                | Orch. Rev.                     |
| Orchis . . . . .                                                       | Orchis.                        |
| Proceedings of the American Pomological Society . . . . .              | Am. Pom. Soc.                  |

| Journals, &c.                                                 | Abbreviated title.      |
|---------------------------------------------------------------|-------------------------|
| Queensland Agricultural Journal . . . . .                     | Qu. Agr. Journ.         |
| Reports of the Missouri Botanical Garden . . . . .            | Rep. Miss. Bot. Gard.   |
| Revue de l'Horticulture Belge . . . . .                       | Rev. Hort. Belge.       |
| Revue générale de Botanique . . . . .                         | Rev. gén. Bot.          |
| Revue Horticole . . . . .                                     | Rev. Hort.              |
| The Garden . . . . .                                          | Garden.                 |
| Transactions Bot. Soc. Edinburgh . . . . .                    | Trans. Bot. Soc. Edin.  |
| Transactions of the British Mycological Soc. . . . .          | Trans. Brit. Myc. Soc.  |
| Transactions of the Massachusetts Hort. Soc. . . . .          | Trans. Mass. Hort. Soc. |
| U.S.A. Department of Agriculture, Bulletins . . . . .         | U.S.A. Dep. Agr.*       |
| U.S.A. Experimental Station Reports . . . . .                 | U.S.A. Exp. Stn.†       |
| U.S.A. Horticultural Societies' publications . . . . .        | U.S.A. Hort. Soc.†      |
| U.S.A. State Boards of Agriculture and Horticulture . . . . . | U.S.A. St. Bd.†         |
| Woburn Experiment Farm Report . . . . .                       | Woburn.                 |

\* The divisions in which the U.S.A. Government publish Bulletins will be added when necessary.

† The name of the Station or State will in each case be added in full or in its abbreviated form.

## NOTES AND ABSTRACTS.

**Aloe dichotoma.** By Leonhard Lindinger (*Beih. Bot. Centralbl.* xxiv., Erste Abth., Heft 2, pp. 211-253; with 4 plates).—A particularly fine specimen of this species having succumbed to disease in the Hamburg botanical garden, the author was enabled to make a thorough microscopic examination of its anatomical structure.

The branching is not truly dichotomous, for remains of a terminal flower axis can be found in the forks. The number of branches is not more than two or at most three. Axillary buds are not produced regularly.

The plant shows distinct adaptation to resist extraordinarily dry conditions of atmosphere, but in the author's opinion (contrary to that expressed by Schenck) it obtains water from the soil by means of its roots. As the upper layers of the soil are often dried up and strongly heated by the sun's rays, the upper part of the root is provided with a well-marked cork layer.

Many, if not all, giant succulents and xerophytes are subsoil water-plants. They have the power of growing vigorously when conditions are favourable, and require for this as much water as, if not more than, other plants. *Aloe arborescens* puts out new growing roots when the earth becomes dry, and these grow rapidly when the plant is watered.

As regards the growth in thickness of the stem, the author considers that it is not a continuous process, but is active during favourable conditions only, so that it can be compared to the ordinary increase in thickness of dicotyledons. *Aloe succotrina* produces every year one ring of vascular bundles and a clearly limited zone is also formed every year in *Yucca filamentosa*, which last is not injured by the German winter.

The author considers that the monocotyledons are descended from tree-like forms with secondary growth in thickness. This ancient character is retained in the arborescent Liliifloræ. The aerial stems of other monocotyledons may be different, and the result of a phylogenetically younger method of growth.—*G. F. S.-E.*

**Alpine Garden at Bourg St. Pierre.** Anon. (*Gard. Chron.*, No. 1134, p. 216, fig. 93, September 19, 1908).—An interesting account is given of the Jardin Botanique de la Linnea at St. Pierre, a small village on the St. Bernard Pass between the Hospice and Martigny. The garden is situated about 5,550 feet above the sea level. It is managed by an international committee, the director being the well-known botanist M. Correvon. A very large collection of Alpine plants will be found in cultivation—not only those which are natives of Switzerland, but others from all parts of Europe, Siberia, and the Arctic regions.—*G. S. S.*

**Alpinia bracteata** (*Bot. Mag.*, tab. 8237).—Nat. ord. *Scitamineae*; tribe *Zingiberaceae*; Eastern Himalaya. Perennial herb with a stem



3-7 feet high; leaves to 2 feet in length, ovate oblong; racemes erect, 5-8 inches long; flowers cream-white, but labellum yellow and crimson.

G. H.

**Anchusa or Bugloss.** By M. Geeckhout (*Le Jardin*, vol. xxii. No. 513, p. 200; July 5, 1908; coloured plate).—The genus *Anchusa* includes some thirty species, found in Europe, N. and S. Africa, and W. Asia. The most interesting are:—

*A. Barrelieri* (syn. *Buglossum Barrelieri*, *Myosotis obtusa*)—native of Southern Europe; blue flowers with yellow throat. *A. capensis*—biennial; not hardy; blue flowers with white tube. *A. italica* (*A. azurea*)—and the Dropmore variety (*grandiflora*). *A. myosotidiflora* (*A. macrophylla*)—Siberian species, with fine blue flowers and yellow throat. *A. officinalis*—indigenous; pinkish-blue flowers. A variety *A. off. incarnata* has bright pink flowers. *A. sempervirens*—indigenous; small blue flowers. *A. tinctoria*—S. France; blue or purplish flowers; root yielding a red colour used in perfumery.

All these species are easily raised from seed, which is to be preferred to cuttings or division.—F. A. W.

**Angadenia nitida** (*Bot. Mag.*, tab. 8233).—Nat. ord. *Apocynaceae*; tribe *Echitideae*; tropical S. America. Climbing shrub; leaves 4-6 inches long; flowers in racemes, corolla yellow, with a vermilion band at the base,  $1\frac{1}{2}$  inch long,  $1\frac{1}{2}$  inch diameter.—G. H.

**Apple, Fall Beauty.** By H. Garman (*U.S.A. Exp. Stn. Kentucky*, 17th Rept. 1905, pp. 82-84; figs.).—A description and illustration of this new dessert apple in use in October.—F. J. C.

**Apple Juice, unfermented.** By N. C. Gore (*U.S.A. Dept. Agr. Bur. Chem.*, Bull. 118, Sept. 1908).—Apple juice being useful as a summer drink, experiments have been undertaken as to the best means of preventing fermentation and moulding.

Sterilization, otherwise pasteurization, has been found preferable to the use of chemical preservatives (benzoate of soda) in the manufacture of fruit juices.

The objections to sterilization are that it gives a "cooked" flavour to the juice, and that the effect is not lasting.

The process can be effected in either wood or tin receptacles. The former are the better, as the juice dissolves the tin to a certain extent, though less when it is coated with lacquer. In clarification tests a milk separator was used, but this is not sufficient to produce absolute clearness. Carbonating disguises the "cooked" taste.

An atmosphere of carbon dioxide on the surface of the liquid delays the formation of mould in sterilized juice when exposed to the air for a limited time. Benzoate of soda checks alcoholic fermentation, but encourages development of acetic acid ferment, which spoils the flavour.—C. H. L.

**Apple Leaf Blister Mite.** By P. J. Parrott (*U.S.A. Exp. Stn.*, New York, Bull. 306, December 1908).—This is a pest of increasing occurrence in the Eastern States, especially in western New York. The

application of a lime-sulphur wash as the buds are swelling and before the leaves appear, followed by the usual sprayings with Bordeaux mixture, has been found an efficient remedy.—*A. P.*

**Apple, Powdery Mildew** (*Podosphaera leucotricha*) (*Dep. Agr. N.Z.*, 16th Report, 1908, p. 110).—This is stated to be the fungus formerly known as *Podosphaera oxyacantha*, and has been very plentiful during the summer months and very destructive. Being a surface mildew it is easy to control with Bordeaux mixture. It often spreads from Hawthorn hedges, which are very subject to attack; hence this plant should not be used as a shelter around orchards.—*M. C. C.*

**Apple-Scab** (*Fusicladium dendriticum*) (*Dep. Agr. N.Z.*, 16th Report, 1908, p. 110; fig.).—This disease has been less in evidence than in former years, and where systematic spraying has been carried out, the loss caused by it has been insignificant.—*M. C. C.*

**Apple-tree Measuring Worm** (*Ennomos subsignaria*). By H. Garman (*U.S.A. Exp. Stn. Kentucky*, 17th Ann. Rept., pp. 79–81; figs.).—One of the looper caterpillars injuring apple leaves in the same way and at the same time as the larvae of the winter moth. The female moth, however, in this case is winged, and hatches out in June, laying eggs which remain unhatched over winter. Spraying in spring with Paris green at the rate of 1 lb. to 150 gallons of water is the only means of dealing with the pest.—*F. J. C.*

**Apples of Maine, Seedling.** By W. M. Munson (*U.S.A. Exp. Stn. Maine, Rept.* 1907, pp. 113–139; figs.).—Descriptions of thirty-five apples raised in Maine are given with figures and comments upon the relative usefulness of the varieties.—*F. J. C.*

**Araceae, Embryology of** (*Bot. Gaz.* July 1908, pp. 35–42, with 3 plates).—Mr. James Ellis Gow describes the ovary, ovule, and development of the ovule in *Nepenthes*, *Dioscorea*, and *Aglaonema*.—*G. F. S.-E.*

**Aster diplostephioides.** By Eekhout (*Le Jardin*, vol. xxii. No. 517, p. 264; September 5, 1908; coloured plate and fig.). Particularly recommended for market purposes as well as pot-culture. A distinct and handsome dwarf plant (25–30 cm. high), flowering May–June in solitary heads of a brilliant purple, with well-marked orange disc, 6–8 cm. in diameter. In habit this plant compares with *Gerbera Jamesonii*, and has the further advantage of being absolutely hardy. Like all Asters, it is easy to propagate whether by seed, division of clump, or cuttings. Sow April–May, in pots or pans, prick out in the autumn; or February–March on hot-bed, and prick out in spring. In dividing, break up the plants in spring or autumn, and let the new growths get a start, well-shaded and watered in the reserve garden. Then transfer to border. Cuttings are struck under a bell-glass, and require a little heat.

*F. A. W.*

**Aster Wilt, *Fusarium* sp.** (*Dep. Agr. N.Z.*, 16th Report, 1908, p. 109).—This disease has been very prevalent and generally appears just



as the plants are commencing to flower. The roots of the affected plants are discoloured and contain a large amount of the mycelium of a fungus with pinkish coloured spore masses. This disease appears to be a soil one, and difficult to control. Asters should not be grown in infected ground for at least two years, otherwise some powdered sulphate of iron should be worked into the soil some weeks before the plants are set out.

M. C. C.

**Astrantia, Biometrical Researches on.** (*Beih. Bot. Centralbl.*, xxiv., Erste Abth., Heft 1, pp. 1-19).—Herr Paul Vogler of St. Gall gives some detailed researches dealing with the number of bracts, of flowers, and of male flowers in *A. major*.—G. F. S.-E.

**Beet Sugar Industry, Progress of, in 1906.** By C. F. Taylor (*U.S.A. Dep. Agr. Report* 84; May 1907).—Gives a great amount of valuable information concerning the progress in securing greater sugar yield and statistics relating to the area under cultivation of this crop in the different States. It is pointed out that beet sugar growing is productive of great good to agricultural interests in many directions.

F. J. C.

**Begonia manicata.** By Ad. van der Heide (*Le Jardin*, vol. xxii. No. 516, p. 244; August 20, 1908; 1 fig.).—A plea for an old and almost forgotten species introduced from Mexico in 1840. Handsome window plant, with large characteristic leaves, adorned like the petioles with long red hairs, which form a sort of gauntlet, and give the plant its name. Abundant rose-coloured flowers. There is also a white variety, *B. m. alba*, and a fine variegation *B. m. aurea maniculata*. It thrives in the winter garden or conservatory, little or no heat being required, although rich soil and plenty of water are essential. Propagation, like other Begonias, by cuttings of leaf or shoot.—F. A. W.

**Begonia Patria.** (*Le Jardin*, vol. xxii. No. 517, p. 258; September 5, 1908).—A cross obtained by M. Lemoine from *B. socotrana* × *B. Pearcei*. It resembles *B. Gloire de Lorraine*, but forms a more vigorous plant with brighter inflorescence. The flowers are magnificent—scarlet, salmon, and copper, with golden under-surface—and are very persistent, lasting unimpaired for more than a month after full development. A plant only 25 c. in height will often carry several hundred blossoms.—F. A. W.

**Botrytis cinerea, Observations on the Biology of.** By F. T. Brooks (*Ann. Bot.*, xxii., July 1908, p. 479-487).—Experiments were conducted with the well-known parasitic fungus *Botrytis cinerea* and the lettuce plant. *Botrytis* conidia were unable to infect healthy green leaves, neither could they infect plants (grown in artificial cultures) weakened by the omission of one or other of the essential elements. On the other hand conidia were capable of infecting wounded leaves just beginning to turn yellow.

Though conidia have no effect on healthy leaves, if young mycelium nourished saprophytically is placed on such leaves infection occurs at once and the fungus spreads rapidly.



In dealing with the question of direct infection of the yellowing leaves and the non-infection of the normal green leaves, the author suggests the following possibilities : (1) that some chemotropic substance present in the cells of the yellowing leaf attracts the germ-tubes, whereas no such chemotropic influence is exerted by the normal leaf ; (2) that in the case of non-infection of a normal leaf some substance from the epidermal cells diffuses through the cuticle in sufficient quantity to neutralize the effect of the small amount of poisonous substance secreted by the germ-tubes, whereas no such substance diffuses from the yellowing leaf ; or (3) that the change in the vital activities of the leaf consequent upon yellowing induces some alteration in the composition of the external cell-walls which enables the germ-tubes to penetrate. It is left for future research to decide which of these suggestions is correct.

With regard to the experiments on the mineral starvation of the host, the results agree with those obtained by Marshal Ward with *Puccinia dispersa*, viz. that mineral starvation of the host had no appreciable effect upon the infective power of the fungus.—A. D. C.

**Bougainvillea Cypheri.** By Aug. Nonin (*Rev. Hort.*, January 1, 1909, pp. 12, 13 ; coloured plate).—A very fine form indeed. Flowers (bracts) nearly twice the size of *B. glabra Sanderiana* shown for comparison. Colour identical, a great improvement.—C. T. D.

**Cabbage and Onion Maggot.** By J. B. Smith and E. L. Dickerson (*U.S. Exp. Stn., New Jersey, Bull.* 200, February, 1907 ; 12 figures).—In New Jersey great losses have been sustained by growers on account of the attack of these maggots upon the plants. Remedies which are successful in one district unfortunately sometimes are of no avail in others. The insects are described and their life histories given. It is considered that cultural methods of control are of little avail against the onion fly, but of great importance in the case of the cabbage maggot. It is recommended that all cabbage roots should be removed as soon as done with and destroyed ; all cruciferous weeds should be destroyed ; where beds of turnips, &c., have been badly affected, the ground should be ploughed late in the autumn and again early in the spring ; when a crop is found to be badly infested early in its growth it should be dug in deeply ; rubbish heaps should be burnt and outbuildings, &c., cleansed by sulphuring or whitewashing. The time of sowing onions also has some influence on the amount of damage done. Late sowing both in autumn and spring was found to be followed by the best results in New Jersey, as the various broods of flies were then avoided. Quick-acting fertilizers are useful, since they bring the plants rapidly over the season when attack is most to be feared. Cabbages and cauliflowers should be firmly planted, since then the newly hatched larva will be unable to make its way down through the hard soil so as to find a part of the cabbage sufficiently tender for it to attack. Various substances were tried, with varying amounts of success, as preventives, including tarred paper cards placed round the stem of the plants upon the soil, carbolic acid and lime, kerosene and sand, powdered tobacco, powdered white hellebore, dry lime, bran and glue ; and as destructive measures, the application of carbon bisulphide, carbolic-

acid emulsion, hellebore decoction, and other things ; and carbolized lime is thought to be the best thing to use. It is made as follows, and is to be applied early, frequently, and thoroughly. The lime is slaked to a thin cream ; three pints of the cream are added to a gallon of water and then a tablespoonful of crude carbolic acid, and the mixture is applied by means of a sprayer along the rows so that the surface of the ground is covered.—*F. J. C.*

**Cabbage, Insects Injurious to.** By H. Garman (*U.S.A. Exp. Stn. Kentucky, 17th Ann. Rep., 1905*, pp. 20-47 ; 17 figs.)

Cases have been reported where poisoning following the eating of cabbages which have been sprayed has occurred. It is pointed out that if reasonable precautions as to stopping spraying sufficiently long before the plants reach a marketable size, are taken, there is so little of the spray left that there is no possibility of poisoning occurring. Analyses are given demonstrating this. The insects attacking the cabbage are then described and figured, and appropriate remedies, usually spraying with arsenical sprays, such as Paris green or arsenate of lead, are recommended. The insects dealt with are the white butterflies or cabbage worms (*Pontia rapae*, the well-known British small white butterfly, and *P. protodice*, the former being the most troublesome of all the insects attacking cabbage), the larvæ of the moths, the cabbage looper (*Autographa brassicae*), the southern cabbage moth (*Evergestes rimosalis*), the cabbage Plutella (*Plutella maculipennis*), an insect of world-wide distribution, the zebra (*Mamestra picta*), the army worm (*Heliothis unipuncta*), the corn worm (*H. armiger*), the woolly bear or tiger moth (*Diacrisia virginica*), the cutworms (*Peridroma margaritosa*, *Agrotis ypsilon*, *Prodenia ornithogalli*, and *Mamestra trifolii*), the flea beetles (*Phyllotreta vittata*, *P. sinuata*, and *Systema blanda*), the spotted cucumber beetle (*Diabrotica 12-punctata*), the margined blister-beetle (*Epicauta marginata*), the harlequin cabbage bug (*Murgantia histrionica*), the false chinch bug (*Nysius angustatus*), the cabbage plant louse (*Aphis brassicae*) the cabbage leaf-miner (*Drosophila graminum*), the turnip leaf-miner (*D. flaveola*) the cabbage Anthomyia (*Pegomya fusciceps*) and the onion thrips (*Thrips tabaci*).—*F. J. C.*

**Camassia esculenta.** By C. Potrat (*Le Jardin*, vol. xxii. No. 517, p. 262 ; September 5, 1908 ; 1 fig.).—A vegetable, one of the *Liliaceae*, indigenous in California. It has the advantage of being a pretty garden-plant, 18 inches high, with bright green leaves and blue flowers, of the *Ornithogalum* type. Two horticultural varieties are *C. e. alba* and *C. e. atro-coerulea*. The plant is hardy, but resents damp. When roasted, the bulb (which is the edible part) has a flavour between a yam and a potato. Flour prepared from it is used in confectionery, and as a remedy for coughs. Cultivate from seeds or offsets. Sow the seeds in July-August, when ripe. Prick out September-October, when the bulbils may also be planted. These will produce flowers the next year, but plants from seed require two years to come to maturity. Flowers May-June. Take bulbils up in August, as soon as the plant turns yellow. They dry very quickly on exposure to air, and should be stacked as soon as possible.—*F. A. W.*



**Campanula Rapunculus (Raiponce).** By C. Potrat (*Le Jardin*, vol. xxii. No. 513, p. 202; July 5, 1908).—This plant is worthy of cultivation as a winter vegetable. Both leaves and root have an agreeable flavour; it may be eaten raw, as salad, or cooked like spinach. The root resembles a crisp white radish. The plant is easily raised from seed, but late sowings (end of June or July) are advisable—otherwise it is apt to run to flower. As the young plants are at first very tender and liable to dry off, it is well to shade them by simultaneously growing some other vegetable, such as summer radishes, which are lifted before the raiponce reaches perfection. It is ready in October and can easily be protected from frost by a light frame and mats.—*F. A. W.*

**Carica Papaya.** By C. Bernard (*Ann. Jard. Bot. Buit.*, vol. vii., pp. 56-68; 2 plates).—The abnormal fruit occasionally produced by *Carica Papaya* is described.—*S. E. W.*

**Carnations, Perpetual Flowering.** By E. C. (*Garden*, January 1909, pp. 14, 30, 39).—The use of these as garden plants is recommended, particularly among roses, and they are stated to be hardy, and Rev. Joseph Jacob, continuing a previous article, gives directions as to the indoor treatment of these plants.

Mr. M. C. Attwood objects to the use of the term "American" in reference to the Perpetual-flowering Carnation, and thinks we are on the eve of further improvement in habit of growth and formation of flower in these plants.—*H. R. D.*

**Carnations, Sporotrichum Bud Rot.** By F. C. Stewart and H. E. Hodgkiss (*U.S.A. Exp. Stn. Genera, N.Y. Tech. Bull.*, October 7, 1908; 4 plates).—Carnations affected with bud rot are invariably infested with a certain fungus (*Sporotrichum anthophilum*, Pk.) almost constantly associated with a particular species of mite (*Pediculoides dianthophilus*, Wol.). Outwardly the affected buds usually appear like normal buds partially opened, but internally they are brown, decayed, and generally mouldy. The stamens, styles, and lower portion of the petals are attacked first; frequently the pistil also is affected. The brown decayed tissue is permeated by the mycelium of the fungus. Experiments prove that the *Sporotrichum* alone is capable of producing the disease. All affected buds should be picked and burned as soon as they appear.—*M. C. C.*

**Ceratozamia, Seedling of.** By Helen A. Dorez (*Bot. Gaz.*, September 1908, pp. 203-217; 4 plates).—The seedling has two cotyledons; the paper deals with its anatomy, certain stages in development, and various morphological details.—*G. F. S.-E.*

**Ceropegia, Vegetative Development of.** By Joseph Glabisz (*Beih. Bot. Centralbl.* xxiii. 1<sup>ste</sup> Abth. Heft 2, pp. 65-136, 30 figs. and 3 plates).—The stem-tubers of this plant are normally formed at the stem-nodes. When separated from the plant both internodes and leaves are capable of producing both tubers and adventitious roots. The free-hanging branches grow at the tip and their adventitious roots remain quite short, but if laid on the ground the latter form strong branching roots



which enable the main shoot to grow more vigorously. When grown in water, the want of nourishment seems to produce an increased formation of tubers and of adventitious roots. The plant can exist and form new growths when supplied with cane sugar only, but not when glycerine is used. If the growing point is prevented from development, the axillary shoots increase greatly, and the formation of tubers is also favoured, especially when the plant is prevented from forming axillary shoots. Tuber formation is favoured by darkness.—*G. F. S.-E.*

**Cherry 'Bigarreau tigré.'** By Max Garnier (*Rev. Hort.*, December 16, 1908, p. 570; coloured plate).—A very handsome dark crimson fruit prettily mottled with lighter tints, or *vice versa*.—*C. T. D.*

**Chestnut Oak in the Southern Appalachians.** By H. D. Hoster and W. W. Ashe (*U.S. Dep. Agr. Forest Service, Circ. 135*; 23 pp.).—This would appear to be a most useful timber, the uses to which it is at present applied being exceedingly varied and numerous. In Western Virginia about one-half of the cross-ties on local railroads are chestnut oak, while for furniture, farm implements, tool handles and in wagon-making the wood is largely employed. Not only is the chestnut oak valuable for its timber, but the bark is extensively used in the tanneries, and employed on account of the tannic acid it contains. The management of the tree, list of insect pests, susceptibilities to fire and injury by grazing, and reproduction by seed and sprout are all carefully explained.—*A. D. W.*

**Chile Culture.** By Fabian Garcia (*U.S.A. Exp. Stn., New Mexico, Bull. 67*, 1908; illustrated).—The chile is largely grown in New Mexico for home consumption. The taste for it among Americans is on the increase. It is rather less tender than the tomato, and can be sown in the open early in April, or raised in frames end of January and planted out. This is the best, though less common way.

The chile resists drought fairly well, but, as it continues bearing as long as it is kept growing, irrigation is valuable.

The pods, when ready for picking green, should be smooth, shiny, and from 4 to 6 inches long.

Chile is canned when green, or eaten fresh (both green and ripe).

*C. H. L.*

**Chrysanthemums** (*Le Jardin*, vol. xxii. No. 521-2; November 5-20, 1908; illustrated).—The whole of No. 521 and several articles in 522 are devoted to the Chrysanthemum. There are pictorial articles on the early varieties and first cultivators of the flower, an article on judging by points, by M. Rivoire—another by M. T. Carnon on grafting—another on fertilization by M. Mommeye, who also contributes an account of the Chrysanthemum and its culture in Japan, with copious illustrations.

*F. A. W.*

**Chrysanthemums, A Classified List of** (*Jour. Soc. Nat. Hort. Fr.*, p. 115, February 1901).—A classified list of all the best varieties of chrysanthemum now in cultivation, prepared with the help of a great many chrysanthemum growers. The groups include the best early kinds,

the best late kinds, the hardest kinds, the easiest kinds to grow ; the dwarf kinds, incurved kinds, the largest-flowered kinds ; the best colours &c.—*M. L. H.*

**Clematis Rust** (*Aecidium Otagense*). (*Dep. Agr. N.Z.*, 16th Report, 1908, p. 109).—Reported on five species of *Clematis*. Only at present known in the cluster-cup stage, and this considerably on the increase. If the infection takes place towards the ends of the climbing branches it would be best to cut away the diseased branches below the points of infection and burn them. Spraying with Bordeaux mixture will to a great extent hinder spore formation and lessen the danger of further infection.—*M. C. C.*

**Clerodendron ugandense** (*Bot. May.* tab. 8235).—Nat. ord. *Verbenaceae* ; tribe *Viticeae* ; tropical Africa. Shrub 3–10 feet high ; leaves opposite,  $1\frac{1}{2}$ – $4\frac{1}{2}$  inches long ; flowers forming a panicle of few-flowered cymes ; corolla irregular, anterior lobe  $\frac{3}{4}$  inch long, violet-blue, others  $\frac{1}{2}$  inch long, pale blue ; filaments purple, arched upwards.—*G. H.*

**Clitoria arborescens, Pollination of.** By A. F. (*Bull. Bot. Dept., Trin.*, No. 58, April, 1908, p. 79).—From the writer's minute observations and careful experiments it appears that the pollination is effected through three distinct processes.

1. It is mechanical, and consists of (first) a sinistrorse and (secondly) a dextrorse gyration of the carina, in which the pollen is brushed from the anthers by stylar brushes into the funnel of the carina.

2. Heavy insects, viz. bees and wasps, visiting and shaking the flowers, cause the pollen to fall into the concavity of the vexillum, whence some grains on the insect's legs are transported to other flowers, and fall into a small protected space formed by the bases of the vexillum and the free anther, the latter helping to rub pollen from the insect.

3. Ants, which visit the flowers freely, carry pollen grains attached to their bodies, and leave them on the stigma.

Protected blossoms artificially dusted with their own pollen were in no instance fertilized.

Under similar conditions cross pollination resulted in a 93 per cent. fertilization.

One plant only has been experimented with, and the writer suspects small flying insects may effect fertilization in its natural habitat, and hopes to make further investigations.—*E. A. B.*

**Codling Worm, Spraying for.** By H. A. Gossard (*U.S.A. Exp. Stn., Ohio, Bull.* 191. February 1908 ; 2 figures and 21 plates).—The experiments in spraying were conducted, in an orchard of about twelve acres, in a district particularly subject to this pest, the principal materials used being Bordeaux mixture, arsenate of lead, and Paris green. There is nothing very definite in the conclusions as to the relative merits of these different washes (p. 117), but the results of the sprayings were very marked, the net profit from spraying (p. 125) an average-sized tree from twelve to twenty years old in one season, at a cost of 30 to 50 cents, being estimated at \$3 to \$7 when the apples were worth \$1 per bushel, a con-



servative estimate of the profit from spraying the whole orchard being \$1,400 (p. 121); trees of the same size (standards 20 feet in height and diameter) in neighbouring unsprayed orchards produced less than one-fourth as much marketable fruit. At least three sprayings annually are recommended to secure good results (p. 125), some growers in the district making five or more; and the essentials for success are stated to be thorough work, applications at the right times, and a good spraying outfit—in this case a gasoline power pump, a 250-gallon tank on trucks with an elevated platform, and bamboo extension rods ten feet long, each terminated by a cluster of four Vermorel nozzles.

Paris green is not recommended for the July spraying, as it is considered to cause excessive falling of the fruit due to the burning of the stems, while Bordeaux mixture or arsenical compounds in cold wet springs conduces to excessive russetting in the fruit (p. 111).—*A. P.*

**Cold Chambers, How to construct.** By S. F. Walker (*Gard. Chron.*, No. 1141, p. 321, figs. 135, 136, and 137, November 7, 21, and 27, 1908).—Very concise directions are given in this paper for the construction of cold chambers, in which cut flowers may be kept fresh for long periods and plants in bud may be retarded. The writer, in mentioning various substances which are more impervious to heat, hardly seems to realize that it is not the matter of which the substance is composed, so much as the amount of air that they contain, which make them good or bad conductors of heat, though he admits that “of all thermal insulators still dry air is by far the best.” Yet he writes of filling the space between two walls with some insulating material, and ramming it well down. One would have thought that if the material was put in lightly it would have been more efficacious; some is wanted to prevent currents of air being set up.—*G. S. S.*

**Coniferous Conescales.** By Dr. Aug. Bayer (*Beih. Bot. Centralbl.* xxiii. 1<sup>re</sup> Abth. Heft 1, pp. 27–44; one plate).—Dr. Bayer by anatomical sections, by the examination of abnormal cones of *Cryptomeria*, and by studying the embryonal development, confirms Velenovsky’s interpretation of the conescales of this genus.

Whereas the ovule is borne on a simple carpel in *Juniperus*, *Thuja* and *Chamaecyparis*, the conescale in *Cryptomeria* is a bract to which is fused a reduced axillary shoot; the teeth of the bract represent so many fertile ovule-bearing carpels which belong to this rudimentary shoot, but are united with the bract.—*G. F. S.-E.*

**Cotoneaster rotundifolia.** (*Garden*, January 1909, p. 19).—“D.” recommends this variety on the ground that the birds do not interfere with the berries as they do in the case of other species of *Cotoneaster*.

*H. R. D.*

**Cotton Wilt.** By W. A. Orton (*U.S.A. Dep. Agr. Farm. Bull.* 333, 1908; with 11 woodcuts).—The most characteristic symptom of wilt is a browning of the woody portion of the stem and root. These discoloured parts are the water-carrying vessels which have become obstructed by the development in them of the fungus causing the disease.



The "wilt fungus" is reported as *Neocosmospora vasinfecta* (Atk.). It lives in the earth on decaying organic matter until it encounters the small feeding roots of the Cotton, which it enters. The fungus penetrates the vascular system of the root and grows upwards into the stem. A rotation of crops must be worked out in detail for each farm to fit its particular needs.—*M. C. C.*

**Cultivation—Soil.**—By Andrew Elliott (*U.S.A. Dept. Agr., Maine*, vol. vii. ; Dec. 1908.—Emphasizes the importance of deep and thorough cultivation.—*C. H. L.*

**Cuscuta Seeds, Distinctions.** By H. von Guttenberg (*Nat. Zeit. Land-Forst*, Vol. 7, pp. 32-43, figures 1-7, January 1909).—The difficulty in distinguishing various species of dodder in clover seeds is pointed out, and a method is described for identification by means of microscope-sections through the seed-coat. The figures give anatomical details ; but, as pointed out later (p. 176), the titles of certain figures have been interchanged.—*W. G. S.*

**Cycas Micholitzii** (*Bot. Mag.*, tab. 8242).—Nat. ord. *Cycadaceae* ; tribe *Cycadeae* ; Indo-China. Stem 2 feet high,  $1\frac{1}{2}$ -4 inches thick ; leaves 2-3, erect, 8-10 feet long,  $\frac{3}{4}$ -1 inch wide ; male cone, narrow-cylindric, 6-7 inches long, with yellow scales.—*G. H.*

**Cyclamen Disease** (*Le Jardin*, vol. xxii. No. 513, p. 204 ; July 5, 1908).—*Heterodora radiculicola*, cyclamen pest, is considered by M. Pylion, Professor of Agriculture at Ferrara, to come like many fungoid diseases from the indiscriminate use of compost of heather and chestnut leaves. Sterilization of earth and pots is recommended, or carbon bisulphide in the proportion of 60-100 grammes per metre cube of compost.—*F. A. W.*

**Daphne, The Genus.** By Emile Cadeceau (*Le Jardin*, vol. xxii. No. 513, p. 199 ; July 5, 1908 ; 1 fig.).—A plea for the introduction of *Daphnes*, other than the *D. Mezereum* and its white var. *albida*. Among those cultivated by M. Lalande, at Malville, near Nantes, are *Daphne japonica*, which is, however, evergreen and perfectly hardy, forming (at Nantes) bushes nearly 5 yards in circumference and covered with sweet-scented blossoms. The leaves have a yellow margin.

*D. odora* differs from *D. japonica* in being only half-hardy. Flowers less abundant, but deliciously sweet.

*D. Dauphini*, with purple flowers, is quite hardy in France.

Other species dealt with are *D. chevrum*, *D. Verloti*, *D. alpina*, and *D. Fortunei*.—*F. A. W.*

**Datura meteloides.** By F. L. Pyman and W. G. Reynolds (*Jour. Chem. Soc.* vol. xciii., Dec. 1908, pp. 2077-2081).—An investigation showed .4 per cent. alkaloids present, including .13 per cent. hyoscyne, .03 per cent. atropine, and .07 per cent. of a new alkaloid, which the authors have named "meteloidine" ; some of the properties of this substance they have investigated, but purpose further research.—*W. A. V.*

**Disease-receptivity and Immunity.** By E. Münch (*Nat. Zeit. Land-Forst*), Vol. 7, pp. 54-75, 87-114, and 129-160, 8 figures, January, February, March 1909).—This investigation deals in an exhaustive manner with questions of importance in diseases of plants. It is not sufficient to name a fungus or other cause in investigating disease, and recent work has been much more directed towards investigation of disposition to disease. A plant is said to be immune when it is in such a condition that it is not attacked by a disease-producing agent. Disposition arises from various conditions, such as locality. The author distinguished "disease-receptivity" as a condition of the plant which favours disease. Thus a plant must be frost sensitive before it can be damaged by frost. The results obtained in this paper may be best illustrated by an example. Pine wood is immune against a particular fungus (*Ceratostomella*) if the volume of air in the fresh wood is below 15 per cent.; with increasing air-volume this fungus grows better and has its optimum growth when the air-content is 42 per cent. of the volume of the wood. This was found to be the case with other fungi, including *Nectria*, the tree-canker fungus. The results lead to the following general principles: the relationship between immunity and receptivity on the one hand, and air-content on the other, holds good for living plants as well as dead stems; different parasitic fungi have different air-requirements.—*W. G. S.*

**Dry-Land Agriculture.** (*U.S.A. Dept. Agr., Bur. Pl. Ind., Bull.* 130, October 1908).—This bulletin consists of a series of papers read at an annual meeting of the Co-operative Experiment Association of the Great Plains area, and is a record of the efforts which are being made to remove the difficulties under which cultivators in the semi-arid regions of the Great Plains are labouring. The questions of conservation of moisture, the prevention of soil-blowing, the use of fallows, the proper rotation of crops, and the breeding of grain and fruit which shall be able to resist the unfavourable conditions of the district are all touched upon. Tabulated statistics are also given of rainfall, temperature, comparative moisture of soil, and cost of producing crops at various experimental stations in the regions.—*M. L. H.*

**Dumortiera, Inflorescence of.** By A. Ernst (*Ann. Jard. Bot. Buit.*, xvii., pp. 153-224; 7 plates).—*Dumortiera trichocephala* and *D. velutina* occur in Java and other islands of the Malay Archipelago. The inflorescence of *D. trichocephala* is monœcious, or frequently androgynous, *D. velutina* is dioecious, and rarely androgynous.—*S. E. W.*

**Electrified Plants.** By A. Koltonski (*Beih. Bot. Centralbl.* xxiii. 1<sup>te</sup> Abth. Heft 3, pp. 204-272, figs. 8 in text).

The paper contains an interesting historical sketch dealing with what has already been discovered in this important subject, followed by a record of the author's careful experiments, which are detailed in fourteen tables.

The researches of Thouvenin and Pollacci have already proved that under electrical currents the process of assimilation is more active

and energetic provided the currents are not so strong as to injure the tissues. The author cannot confirm Pollacci's observation that even in the dark, electrical stimulation will produce assimilation.

His own experiments were carried out with plants of *Elodea* placed in water. When the current passes from the base to the tip, assimilation is favoured, but when it passes in the reverse manner, the current has an injurious effect.

When the current passes through the water only, it has also a favourable effect, however the plant is placed (parallel to or at right angles to the stream lines), except when passing from the tip to the base, when it is decidedly injurious. It is apparently comparatively easy to electrocute *Elodea*. With a sufficiently weak current the stimulation of assimilation can be carried on indefinitely.—*G. F. S.-E.*

**Encephalartos Barteri** (*Bot. Mag.* tab. 8232).—Nat. ord. *Cycadaceae*; tribe *Encephalarteeae*; West Tropical Africa. Stem short, 1 foot high, 9 inches diameter. Leaves  $3\frac{1}{2}$ – $5\frac{1}{2}$  feet long; male cone pale, narrow-cylindric, 5–9 inches long; female cone dark olive, 8 inches long; seeds with crimson testa.—*G. H.*

**Endosperm of some Graminaceae, The Vitality and Self-digestion of.** By D. Bruschi (*Ann. Bot.*, xxii., July 1908, pp. 449–463).—The paper is an abstract of the author's previous work on the subject which has been published in Italian journals. It is shown that the starchy endosperm of maize, barley, wheat, and rye can digest itself in the absence of the scutellum and other parts of the embryo, though to a very different degree. The self-emptying can go on in the absence of any vitality in the amyliiferous cells, because the starch hydrolysis is accelerated by a strong amylose which arises from a pro-enzyme existing in the endosperm of the resting seed, and becomes active even though every trace of vitality has been removed from the entire endosperm. Vitality is not, however, wholly denied to the endosperm cells. It is possessed by the aleurone cells at the periphery of the endosperm and also in one or two sub-aleuronic layers, whence it lessens by degrees till it completely disappears towards the middle of the endosperm.—*A. D. C.*

**Enzymes.** By Professor Kohl of Marburg (*Beih. Bot. Centralbl.* xxiii. 1<sup>te</sup> Abth. Heft 1, pp. 64b–64o).—Professor Kohl of Marburg has an important paper on the reverse working of various enzymes and on the effect of external factors on enzymes such as invertase and maltase to which reference should be made in the original.—*G. F. S.-E.*

**Eranthemum Wattii** (*Bot. Mag.* tab. 8239).—Nat. ord. *Acanthaceae*; tribe *Ruellieae*; North India. Perennial herb; leaves ovate,  $2\frac{1}{2}$ –4 inches long; spikes paniculate; flowers 1 inch diameter, purple.—*G. H.*

**Eria rhynchostyloides** (*Bot. Mag.* tab. 8234).—Nat. ord. *Orchidaceae*; tribe *Epidendreae*; Java. Epiphyte; leaves 6 inches to 1 foot long; flowers whitish with a purple column, in a dense raceme, 7 inches long.—*G. H.*



**Escallonias.** By J. Clark (*Gard. Chron.*, No. 1146, p. 408, December 12, 1908).—This paper consists of an annotated list of the best species of this genus, and the author says "some of them are unfortunately too tender to be generally recommended, but full exposure to the sun and a poor, fairly dry soil will enable some of them to withstand much more severe weather than they otherwise would."—*G. S. S.*

**Evolution—Descent of Angiosperms.** By Hans Hallier (*Beih. Bot. Centralbl.* xxiii. 2<sup>te</sup> Abth. Heft 2, pp. 81–265).—Herr Hallier, in the course of a very exhaustive inquiry into the affinities of *Juliania*, gives evidences for his belief that the Angiosperms are descended from now extinct Magnoliaceae which had hermaphrodite, acyclic and apocarpous flowers with a perianth and branched stamens. These sprang from Gymnosperms which resembled *Cycas*, *Anomozamites* and *Cycadeoidea* in appearance.

He supposes the lines of descent to be somewhat as follows: Julianales (also Juglandales, Anacardiaceae &c.) from Terebinthaceae, Rutaceae, Saxifragaceae, Hamamelidaceae, Illicieae, Magnoliaceae.

The paper is of great importance in connection with the vexed question of the descent of Angiosperms.—*G. F. S.-E.*

**Evolution, Methods and Causes of.** By O. F. Cook (*U.S. Dep. Agr., Bur. Plant Industry, Bull.* 136, pp. 31, October 31, 1908).—This paper expresses, in a somewhat dogmatic form, the author's views upon the theory of evolution. He lays stress upon the fact that selection does not make new characters. On this point Dr. Alexander Graham Bell (cited in the introduction) also points out that "though natural selection may cause the death of the unfit, it cannot produce the fit—far less evolve the fittest. . . . A closed gate may block a road, but it does not push the traveler (*sic*) into a new path."

In one place the author says "transfers of cotton and other plants to new conditions are often followed by striking changes of characters far beyond the range of ordinary environmental accommodations." On the next page: "It has not been shown that the environment has any active constructive influence in descent either in individual organisms or in species at large."

He seems to ascribe the greatest significance in evolution to the "normal diversity of natural broad-bred species." He does not explain how the original species became diverse. But the precise position adopted by the author is elaborated in the paper itself.—*G. F. S.-E.*

**Fairy Rings on Lawns.** (*Garden*, January 1909, p. 13.)—For the destruction of these rings, Bordeaux Mixture or sulphate of iron, using 8 lb. to the gallon, is recommended.—*H. R. D.*

**Flora of Turkestan.** (*Beih. Bot. Centralbl.* xxiii. 2<sup>te</sup> Abth. Heft 3, pp. 341–386).—Fedtschenko's Conspectus is continued in this paper, which is concerned only with *Astragalus* (27 species).—*G. F. S.-E.*

**Fodder-hairs, Wax and Honey.** By Dr. Josef Fahringer (*Beih. Bot. Centralbl.* xxiii. 1<sup>te</sup> Abth. Heft 3, pp. 191–203; one plate).

Dr. Fahringer in a criticism of Porsch's account of the Flowerwax and "Fodder-hairs" of certain orchids gives an interesting review of the

chemistry of these and similar bodies. Flower-honey contains a much larger amount of water and more saccharose than bee-honey, which last contains dextrin, nitrogen, and formic acid. None of these substances occur in the flower-honey.

The fodder-hairs resemble pollen in containing fatty acids and nitrogenous substances, but are much richer in nitrogenous material.

The wax of *Ornithidium* is used, in his opinion, for propolis; it both guides larger insects to the flower and also keeps off unbidden guests which often get stuck on the sticky surface. It is especially flowers that have no pollen to spare that produce it.—*G. F. S.-E.*

**Forest Scenery of Cameroons.** By Dr. F. C. von Faber (*Beih. Bot. Centralbl.* xxiii. 2<sup>o</sup> Abth. Heft 1, pp. 26-42).—Dr. von Faber gives a very readable account of the vegetation of this part of tropical Africa illustrated by five good photographic plates.

The rainfall at Bibundi reaches the enormous amount of 11,900.65 millimetres, which is one of the heaviest known in the world. The chief peculiarity of the vegetation is the rich rain-forest or tropical wet jungle which ascends the mountains sometimes to 2,000 m. altitude or in ravines to 2,700 m.

There are clear and interesting descriptions of the mangrove creeks and of the way in which the mangroves give place to other plants when the soil level becomes higher than that of ordinary high tides. This first vegetation consists chiefly of *Raphia* palms, with *Pandanus*, *Phoenix spinosa*, and *Rotanga*. There are also many interesting details about the oil palm and its cultivation, Cola, the silk-cotton tree and other useful plants.—*G. F. S.-E.*

**Freezing, Fall and Early Winter Injuries to Orchard Trees and Shrubbery by.** By A. D. Selby (*Agr. Exp. St. Ohio, Bull.* 192; figs.).—This bulletin goes fully into the unprecedented damage done to orchard trees and shrubs during the unusually severe winter of 1906-7. The losses were most pronounced upon young apple orchards; the percentage of seriously injured trees ran extremely high and with certain varieties was astonishingly large. The investigations will no doubt prove extremely valuable in determining which varieties of apple are most suitable for withstanding severe frosts, and under what conditions of growth and soil, and other surroundings, they are safest from injury.

*A. D. W.*

**Frost, Notes on.** By E. B. Garriott (*U.S.A. Dept. Agr., Farmers' Bull.* 104, 1908).—In the States protection against severe frost is very essential, as it often means saving the life of acres of plants and trees, and also makes it possible to put an early and paying crop on the market.

This protection is applied to orchards, berry plantations, and vegetables, and is effected in different ways according to situation, extent of land, and duration of frost. Irrigation, flooding, and spraying with water, by supplying moisture to the air, lessens danger from frost. Smudge fires, produced by burning damp material such as straw, manure, or prunings are a recognized means of protection, and should, to be efficacious, be numerous and well distributed.

Where coal is used to raise the temperature, twenty to fifty baskets of fire are required to the acre.

Other means of protection are earthing-up, mulching with hay, and screening of light material.

The forecasts of the Weather Bureau are an invaluable aid to growers.

C. H. L.

**Frost of April 19-20, 1908.** By L. Chasset (*La Pomologie Française*, June 1908, p. 163).—The effect of the frost is not entirely shown by the number of flowers that open on the day of the frost and the following days; their opening is not hindered, but upon attentively examining the pistils and stamens, one sees that they are blackish from the time of the opening of the petals. The varieties of Pear that resisted the frost best were 'Beurré Clairgeau,' 'Triomphe de Vienne,' and 'Marguerite Marillat'; although the following varieties were planted by the side of these three, in spite of the abundance of blossom none of them bore fruit: viz. 'Beurré Hardy,' 'Le Lectier,' 'Duchesse d'Angoulême,' 'Figue d'Alençon,' 'Beurré Diel,' 'Directeur Hardy,' 'Belle Angevine,' 'Beurré gris.' The 'Reinette du Canada' Apples planted as cordons suffered equally, because of their early blossoming; the variety 'The Queen,' on the contrary, fruited abundantly.—C. H. H.

**Fruit Crops, Reports on the Condition of our.** (*Gard. Chron.*, No. 1,127, p. 84, August 1, 1908).—This report gives in a tabulated form the observations made by a large number of correspondents in the various counties in the British islands on the condition of the fruit crops; in the grand summary the figures for 1907 are given for comparison.—G. S. S.

**Fruit Gardens for the Intensive Cultivation of Choice Fruits, Establishment of Model.** By O. Opoix (*Pomologie Française*, February 1908, pp. 100-112).—The chief gardener of the Luxembourg suggests that taking into consideration the rapid increase in fruit growing in the last ten years, and competition especially with regard to apples from America, model fruit plantations should be established in the fruit districts of France. He explains the choice of soil, situation, treatment, walls for espaliers, with the best varieties of pears and apples for the climate of Paris, also for the centre, east and north of France, and gives details of cost of establishment and returns from a garden such as he suggests, of which a plan is given, established by M. Grouas at Precy-sur-Oise (Oise), the area being about  $1\frac{1}{2}$  acre.—C. H. H.

**Fruit injured by Insects.** By H. Garman (*U.S.A. Exp. Stn. Kentucky*, 17th Ann. Rept. pp. 63-78).—Injuries to fruit through the skin being cut (and pulp being afterwards extracted through the slit by bees) have been traced to tree crickets (*Oecanthus angustipennis* and *Oe. niveus*), which slit the skins of peaches, plums, grapes, &c., at night, and the common green "June bug" or beetle (*Allorhina nitida*). The remedy suggested against the last is to shake the beetles into a pail of water covered with a film of coal tar. It was found that the insects very frequently inoculated the fruits which they bit with the spores of the brown-rot fungus, fruits which were protected from being bitten by a muslin cover or by spraying remaining perfectly healthy.—F. J. C.



**Fruit Trees, Arrangement of, on a Plantation.** By the Duke of Bedford, K.G., and Spencer U. Pickering, F.R.S. (*Woburn, Ninth Report*, 1908, pp. 80-86).—The hexagonal arrangement produced an improvement in results as compared with planting on the square, but the experiment was on too small a scale to justify a modification of the conclusion previously drawn—that the slight improvement is not worth consideration in comparison with the cultural advantages presented by the square arrangement.—*A. P.*

**Fruit Trees, Chemical Manures for.** (*Jour. Soc. Nat. Hort. Fr.*, p. 763, December 1908).—According to the writer, owing to the character of their root system, chemical manures are not so suitable for fruit trees as organic manures.—*M. L. H.*

**Fruit Trees, Influence of the Date of Planting.** By the Duke of Bedford, K.G., and Spencer U. Pickering, F.R.S. (*Woburn, Ninth Report*, 1908, p. 73).—Twenty-nine out of forty-two trees planted on November 14 showed the formation of rootlets by January 16 following, the plum stocks having made the greatest number of rootlets, and experiments lead the authors to the conclusion that where planting cannot be done till late in the season it is best to defer lifting the trees from the nursery till the ground is ready to receive them. The advisability of cutting trees at the time of planting, even when the trees are planted late in the season, is still maintained (pp. 74-75).—*A. P.*

**Fruit Trees, Planting above the Ground Level in Heavy Soils.** By the Duke of Bedford, K.G., and Spencer U. Pickering, F.R.S. (*Woburn, Ninth Report*, 1908, p. 71).—After ten years' growth there was no appreciable difference between trees so planted and those planted in the ordinary way.  
*A. P.*

**Fruit Trees, Nourishment of, by Injection.** By G. Fron (*Jour. Soc. Nat. Hort. Fr.*, p. 54; January 1908; Figures).—An account of the treatment of sickly and badly nourished trees by injection of sulphate of iron and calcium acetate into the trunk. The operation is admitted to be a delicate and dangerous one, and the results are so far so little assured that it is on the whole advised rather to renew the soil round starved trees or to transplant those in unsuitable positions.—*M. L. H.*

**Fruit Trees: Ramming the Soil when Planting.** By the Duke of Bedford, K.G., and Spencer U. Pickering, F.R.S. (*Woburn, Ninth Report*, 1908, pp. 7-30).—The soil was rammed with a heavy rammer till the whole was thoroughly puddled and shook like a jelly at each stroke. The number of cases where this treatment produced increased growth in the first and second seasons after planting, compared with that of trees carefully planted in the usual way, was from four to six and a half times greater than where the opposite was the case. As regards fruiting, no positive conclusions could be drawn. The authors explain the results as being due to the closer contact of the soil aiding in the formation of adventitious root-fibres from the main roots, where there is the greatest store of food material; the fibrous roots, which we have always been told to spread out so carefully, containing but little accumulation of reserve

material out of which new rootlets may be made, and on trees which have undergone a journey, at least, seldom making any but the feeblest growth. The scientific basis of the results of this improved contact of the soil with the roots, and of the varying behaviour of the latter when rammed in different soils, is dealt with in an article by Mr. Pickering in his "Studies on Germination and Plant Growth" in the Appendix to this Report (reprinted from the "Journal of Agricultural Science," vol. 2, part iv.).

A. P.

**Fruit Trees : Root Injury on Planting.** By the Duke of Bedford, K.G., and Spencer U. Pickering, F.R.S. (*Woburn, Ninth Report*, 1908, pp. 38-56).—The conclusions arrived at confirm those expressed in the Fifth Report: namely, that the various items which are supposed to constitute "bad practice" in planting are not only not deleterious to the trees, but result in a certain amount of good, and the authors justify this by referring to experiments which go to show that trees benefit by the removal of fibres up to 1 mm. in diameter, as well as by the shortening of the larger roots, the latter practice helping the formation of more vigorous adventitious roots nearer the stem, and they maintain that it is the formation of new roots, and not the preservation of old ones, which should be the aim in planting trees.—A. P.

**Fruit Trees: Trenching the Soil before Planting.** By the Duke of Bedford, K.G., and Spencer U. Pickering, F.R.S. (*Woburn, Ninth Report*, 1908).—The bastard trenching of the soil before planting has not, as a rule, produced any good results, and the authors advise growers not to go to the expense of trenching without strong evidence that such a process has actually been found to be beneficial to the particular soil in question. Where the soil is deep and fertile it may have good results, as well as in cases where it improves the drainage.—A. P.

**Fruits in Virginia and South Atlantic States, Orchard.** By H. P. Gould (*U.S.A. Dept. Agr., Bur. Pl. Ind., Bull.* 135, December 1908).—This is the first published report of the fruit district investigations of the Bureau of Plant Industry, and the object in making them has been to ascertain the limitations within which fruit varieties may be profitably planted in these regions, as indicated by the manner in which they respond to the influences of their environment, the success of a given variety being not alone "its ability to develop to a high degree of perfection, but its commercial value in terms of profit and loss when placed upon the market" (p. 9). Based upon the observations of 63 growers, descriptions are given of all the varieties of fruits commonly grown in the districts in question (pp. 30-62) with their varying behaviour at different elevations and in different soils, and these are supplemented by elaborate phenological records by the same observers (pp. 68-95). For instance, there are returns by 53 growers on Ben Davies apple, giving the latitude, elevation, slope, and soil where it was grown in each case, with the dates of blossoming in given years and of the last spring and first autumn frosts, the times of gathering, the periods of its season, &c. The report must prove a boon to intending planters in the States mentioned, and is an object lesson which should not be missed by all Government and



county officials who are concerned in rendering assistance to fruit-growing in this country.—*A. P.*

**Fumigation of Nursery Stock, Tests of Gases for.** By W. E. Britton (*Journ. Ec. Entom.*, I. (1908), Pt. 2, pp. 110–112).—These tests were undertaken with a view to find some gas more convenient than hydrocyanic acid gas for fumigating small parcels of nursery stock. The fumigation was carried out in an oblong box, and two generators were used—one at each end. Apples infested with San José scale were used. The gases tested were carbon bisulphide, carbon tetrachloride, sulphuretted hydrogen, and chlorine, while for purposes of comparison hydrocyanic acid gas in three different quantities was used. No recommendations are yet made.

*Carbon bisulphide.* This was volatilized in iron pans which had been heated. When used at the rate of 10 oz. to 100 cubic feet for one hour, 4·3 per cent. of the scales survived and one tree died. When 60 oz. of carbon bisulphide to 100 cubic feet was the charge, allowed to act for three hours at 59° F., all the scales were killed and the trees uninjured. After being exposed to gas of a strength above this, half the trees failed to grow.

*Carbon tetrachloride.* All the scales were killed and the trees were uninjured where 80 oz. or less to 100 cubic feet was used and allowed to act for two hours.

*Hydrocyanic acid gas.* Generated with 1 oz. of potassium cyanide to 2 oz. sulphuric acid and 4 oz. of water to each 100 cubic feet, all scales were killed. In one case, after fumigating for half an hour, one tree died. In most other cases the trees were uninjured, even by larger quantities of gas acting for a longer period.

*Sulphuretted hydrogen.* Generated from iron sulphide 20 oz., sulphuric acid 80 oz. (fluid), water 32 oz. (fluid). The quantity of iron sulphide for 100 cubic feet was 9 lb.; and other strengths used were 12½ lb. and 25 lb. In the last case 20 per cent. of the trees were injured after fumigation for two hours; but in other cases no injury followed, and all the scales were killed.

Difficult of application, on account of the long time taken to generate the gas.

*Chlorine.* Generated from bleaching powder 14 oz., sulphuric acid 17 oz. (fluid), water 70 oz. (fluid). The quantities used varied from 8·6 lb. to 34·7 lb. to each 100 cubic feet, and all the scales and most of the trees were killed.—*F. J. C.*

***Galanthus plicatus.*** By S. Arnott (*Garden*, January 1909, p. 18).—The author describes *G. plicatus*, and refers to *G. Fraseri*, *Chapelii*, and other garden varieties of this Snowdrop. He thinks they enjoy the same garden conditions as the common Snowdrop, but are liable to die off without apparent cause, and are subject to the fungoid disease which attacks Snowdrops of any species.—*H. R. D.*

**Gardenias and their Culture.** By Ad. van der Heide (*Le Jardin*, vol. xxii. No. 514, p. 213; July 20, 1908).—The Gardenia was introduced from India in 1754. *G. florida flore pleno* is known to everyone.



A less common variety, *G. f. Fortuneana fl. pl.*, was brought to the Royal Society from China. It bears large white blooms like *Camellia alba plena*, but is seldom seen now. *G. f. radicans* Thunberg, introduced from Japan by Fortune, a dwarf plant, with tiny double flowers, very sweet scented (erroneously termed Cape Jessamine), and *G. florida foliis variegatis* have both died out. Others worthy of culture were *G. amoena* (Simson), with single flowers, pink and white upon the same corolla; *G. citriodora*, pure white lemon-scented flowers; *G. Stanleyana* Hooker, from Sierra Leone (1840), flowers on long tubes like a *Datura*, white, with purple blotches, and many others are enumerated in this article.

The French culture of *G. florida fl. pl.* differs from the English inasmuch as the flowers are wanted for the Paris winter market. Cuttings are struck in January in greenhouse or hot-bed, and transferred to pots of successively larger sizes, keeping in warm house till June. They are then planted out in heath mould, and left in the open till October, when they should be transplanted to the hot-house and watered freely. This makes them break into full bloom. When the flowering season is over the old plants are burned for firewood. The practice of planting out during the summer lessens the danger of insect pests, to which Gardenias are so liable. It is, however, well to make precautionary use of insecticides.—*F. A. W.*

**Germination of Hard Seeds: Hot Water Method.** By J. Tixier (*Le Jardin*, vol. xxii. No. 515, p. 235; August 5, 1908).—The author tabulates the results of his experiments for three years with seeds which are prevented by a hard shiny coat from ready germination.

**Method.**—Take quite boiling water, and keep it on the boil. Plunge in a small sieve or pocket of wire gauze containing a very few seeds, and leave it in the boiling water for a time determined in each case by the hardness of the seeds. (Next, for small seeds, plunge into cold water; but omit this for large seeds.) Sow in pots, or in the open, according to nature of seed. Only a few should be dipped simultaneously, in order to ensure full action of the boiling water, which dissolves the hard varnish they are coated with. In some cases, where soaked seeds have germinated according to the following table, and the controls (unsoaked) have remained unchanged for three months, a subsequent treatment with boiling water has induced germination at the normal period.

| Name of Plant                          | Length of Immersion | Lapse of Time before Germination |
|----------------------------------------|---------------------|----------------------------------|
| <i>Genista monosperma</i> . . .        | 10 sec.             | 9 days                           |
| <i>Templetonia glauca</i> . . .        | 10 "                | 12 "                             |
| <i>Brachysema latifolia</i> . . .      | 10 "                | 15-20 days                       |
| <i>Chorizema ilicifolia</i> . . .      | 15 "                | 15-20 "                          |
| <i>Kennedya Lindleyana</i> . . .       | 20 "                | 15-25 "                          |
| <i>K. ovata rosea</i> . . .            | 10 "                | 15 days                          |
| <i>K. rubicunda et prostrata</i> . . . | 15 "                | 15 "                             |
| <i>Mucuna pruriens</i> . . .           | 20 "                | 10-15 days                       |
| <i>Tephrosia grandiflora</i> . . .     | 10 "                | 10 days                          |
| <i>Sophora secundifolia</i> . . .      | 10 "                | 10-20 days                       |
| <i>Mimosa Baileyana</i> . . .          | 10 "                | 12 days                          |
| <i>M. podalyriaefolia</i> . . .        | 20 "                | 12 "                             |

*F. A. W.*

**Germination of Seeds** (*Le Jardin*, vol. xxii. No. 513, p. 204; July 5, 1908).—M. Demoussy (*Bull. des Comptes-rendus Ac. Sc.*) has calculated the influence of the hygrometric state of the atmosphere on the vitality of seeds. He finds that when it exceeds 0·7 at a temperature of 25° C. many seeds perish: the Cruciferae are among the most resistant. A drier atmosphere is more generally favourable, but chervil, poppy, and *Digitalis* suffer in dry air. Parsnips can stand a hygrometric depression to 0·3.—*F. A. W.*

**Gnetum Gnemon, Embryo of** (*Bot. Gaz.* July 1908, pp. 43–50, with 1 plate).—Professor John M. Coulter describes the embryo sac, embryo, and endosperm-development.—*G. F. S.-E.*

**Grafting, Modifications in the Constitution of Plants produced by.** By M. C. Laurent (*Jour. Soc. Nat. Hort. Fr.*, p. 713, December 1908).—These modifications are of three sorts—in external appearance, in chemical constitution, and in resistance to parasites—and the result of M. Laurent's investigations goes to prove that the actual chemical composition of grafted plants differs from that of either stock or scion on its own roots.—*M. L. H.*

**Growth, Laws of.** By Georg Ritter (*Beih. Bot. Centralbl.* xxiii. 1<sup>te</sup> Abth. Heft 3, pp. 273–319).—This is an important biometrical study of the growth in length, in surface and in cubic contents of various plant organs such as internodes, length and size of seeds, dimensions of leaves in various habitats, &c.

The author concludes that, in organic growth, the law of Quetelet is on the whole confirmed. Up to a certain point the process of formation seems to be independent of external conditions. A tendency to exceed or fall short of the mean is regulated by inheritance and must be inherent in the protoplasm.

When material has been obtained from different localities in which selection has been at work, the curves found show distinct differences. New culminating points may appear, and there may be a change in the value of the mean character. When a new maximum has been established by selection, the development may be discontinuous but is still on the same lines, and is only influenced by degrees. This holds of Giantism, Nanism, Malformations, Anomalies, &c.

The author remarks how the so-called Fibonacci series seems to underlie the laws of growth in almost all the cases studied.

These extracts may serve to show the importance of this paper in biometry, but it is exceedingly difficult to give any satisfactory abstract of the author's conclusions without a far larger space than is here available.

*G. F. S.-E.*

**Guatemala Plants, New.** By John Donnell Smith (*Bot. Gaz.*, xlv., August 1908, pp. 109–117).—New species of *Capparis*, *Eurya*, *Picramnia*, *Dalbergia*, *Miconia*, *Clidemia*, *Centropogon*, *Ardisia*, *Stylogyne*, *Gonolobus*, *Solenophora*, *Pilea*, and *Myriocarpa*.—*G. F. S.-E.*

**Gum Disease of Citrus Trees in California.** By Ralph E. Smith and O. Butler (*U.S.A. Exp. Stn. California, Bull.* 200, 1908; with



14 figs.).—Gummosis is a term applied to a condition in which an exudation of gummy sap takes place through the bark. Such a flow of gum is almost always connected with a dying or unhealthy condition of the tree. Such troubles are particularly characteristic of two classes of trees, citrus and stone fruits.

The most important consideration in regard to the control of gummosis is the fact that, since the disease is brought about solely by unfavourable conditions, it can be more easily prevented by avoiding those conditions than it can be cured after once started. In the choice of location heavy wet ground should be avoided, unless it can be drained or improved in some manner.—*M. C. C.*

**Helianthus or Salsify.** By P. Graebner (*Not. König. Bot., Berlin*, No. 44, p. 107, 108).—In recent years the name of *Helianthus* or Salsify has been given in commerce to a plant of extraordinary productiveness. It grows to a height of 10 feet, and is used as food for cattle, and the tubers as a vegetable. The author identifies it as *Helianthus macrophylla*.  
*S. E. W.*

**Horticultural Society, Indiana. Report of the Proceedings of the year 1907.**—As usual in these Transactions of American Horticultural Societies, the apple claims the greatest attention.

In Indiana apparently neither climate nor situation generally is really quite suited to fruit culture, but much can be achieved by intelligent care; and one paper in this volume recounts the adventures of a special train run over the system of the Baltimore and Ohio South-Western Railroad under the auspices of that Railway Company, the Purdue Experiment Station, and the State Horticultural Society. The train carried lecturers, magic-lantern apparatus, samples of fruit, and diagrams of various sorts, and preached the gospel of fruit-growing in towns, villages, and to hastily summoned buggy-loads of interested farmers at wayside stopping-places through a long strip of Southern Indiana. Other subjects treated of in this volume are melon, potato, cherry, onion, peach, pear, strawberry, and plum culture; remedies for and prevention of the attacks of garden pests; marketing fruit, cider and vinegar making, the State inspection of orchards and nursery stock; and spray mixtures. An account is also given of a successful method of protecting orchards from severe frosts by lighting fires of wet straw or wet stable manure here and there among the trees. On fairly still nights the smoke, mixed with the fog produced by the condensation of the steam from the wet fuel, hangs low over the trees and acts as a screen to check the radiation of heat from the plants, and even increases the temperature of the air to a considerable height above the ground.

*M. L. H.*

**Inflorescence of the Pear and the Apple, Notes on the.** By Claude Abrial and L. Chasset (*La Pomologie Française*, August 1908, pp. 243-5).—In apple the terminal flower is the largest and expands first, the lateral flowers expanding from the periphery towards the centre like an ordinary corymb. In the pear, on the contrary, the corymb is indefinite, only the flowers of the periphery are fertile and the central flowers are sterile; in the Williams' Pear, the flowers of one corymb expand almost



all at the same time, the flowers at the outer edge open more widely than those of the centre; the three flowers which terminate the cluster do not expand at the same time, the most central flower expands at the same time as the other flowers of the cluster, while the two which accompany it are still in bud. Only a small number of flowers borne by a tree are destined to give fruits; most act as male flowers producing a considerable quantity of pollen. If the flowers are thinned in the apple the lateral flowers would be cut out, keeping the terminal; if the terminal is missing, leave two or three of the innermost. With the pear, on the contrary, the central flowers would be cut out and the lateral ones left. The number of flowers left would be ruled by the variety, the varieties with small fruit having the most flowers left.

Photographs of pear inflorescences show two central flowers already fallen, and the small flower at the extremity ready to fall, whilst two outside fruits springing from the base of the cluster are well set.

The photographs of apples show the central fruit larger, and stem more fleshy, whilst those at the base, on the contrary, have thin stems and fruit hardy formed.

The hope is expressed that research will be made to find out which varieties of Pears and Apples are the best suited as fertilizers (i.e. pollen producers).—C. H. H.

#### **Insecticides—Nicotine, Lead Arsenate, and Paraffin Emulsion.**

By the Duke of Bedford, K.G., and Spencer U. Pickering, F.R.S. (*Woburn, Tenth Report*, 1909, pp. 35-42).—Further experiments were made in continuation of those detailed in the Eighth Report (p. 83) to test the comparative insecticidal effect of these three washes. Nicotine was not successful with caterpillars generally, and quite inoperative against the winter moth caterpillar, which was completely destroyed by paraffin emulsion (solar distillate 1½ per cent. emulsified with iron solution), as was also the grub of the gooseberry and currant sawfly. The emulsion was much more effective than lead arsenate and did not interfere with the sale of the fruit, but it cannot be used while the trees are in blossom. The experiments were mainly restricted to these two pests. Paraffin emulsions are quite harmless if properly made, but the precaution of churning them up again with a syringe should always be taken (pp. 43-46).

A. P.

***Ipomoea mexicana grandiflora alba.*** By B. Chabaud (*Rev. Hort.*, December 1, 1908, pp. 552, 553).—From the description this *Convolvulus* is extremely attractive, the flowers being very large and sweetly scented. It flowers, however, in the evening and fades early in the day; but as it flowers for a week after cutting, this drawback is largely discounted. It is also known as the 'giant white *Ipomoea*.'—C. T. D.

***Iris germanica.*** By P. de Vilmorin (*Jour. Soc. Nat. Hort. Fr.*, p. 653, November 1908).—A note on the parentage of the *Iris germanica* as we know it and a description of some new varieties obtained by the author.—M. L. H.

***Iris germanica macrantha.*** By Ph. de Vilmorin (*Rev. Hort.*, December 1, 1908, pp. 544, 545; coloured plate).—Two very beautiful

varieties are figured: 'Isoline,' standards very wide, white, tinged with violet at margin, yellowish at base, falls long and decumbent, light violet red, with brown streaks at base; and 'Diane,' plant somewhat dwarf, but flowers equally large, standards light lilac, falls widespreading and darker in tint with brownish-orange basal stripes.—C. T. D.

**Japanese Maples.** By J. Clark (*Gard. Chron.*, No. 1,138, p. 273, October 17, 1908).—The author of this paper says that "many species of *Acer* are indigenous to Japan, but the term 'Japanese maple' is ordinarily applied in gardens to *Acer japonicum* and *A. palmatum* together with their respective varieties. The former of these was introduced to this country, according to Loudon, in 1820, and the latter some forty years later. These maples are perfectly hardy, not fastidious as to soil and situation, provided the latter is not too shaded. They are liable to be cut by late spring frosts, but they quickly recover from its effects." A selection of Japanese maples that can be recommended to the ordinary planter, some fifteen in number, is then given with a short description of each variety.—G. S. S.

**Java: the Virgin Forest of the Equator.** By M. Treule (*Ann. Jard. Bot. Buit.*, vol. vii., pp. 144-152).—In a primeval forest in the rainy district of the west of Java the leaves of the giant trees are covered with lichens and mosses; the branches bear innumerable orchids, Gesneraceae, Piperaceae, and ferns. The trunks of the trees support climbers. Each giant tree exhibits a combination of all kinds of vegetable forms: a rich and varied flora. The undergrowth of the forest abounds in tree ferns, palms, *Pawlanus*, and Musaceae, and in their shade flourish innumerable herbaceous plants. The whole is traversed by lianas and aerial roots. Not only a struggle for existence takes place in the virgin forest, but also on the other hand co-operation and federation.

In an artificial wood planted forty years ago solely with *Schima Noronhai* (in a similar situation to the virgin forest just mentioned), 140 species of plants occur in an area of 4 hectares. The complete absence of lianas and epiphytes formed a striking contrast to the primeval forest.

S. E. W.

**Kaulfussia and Gleichenia, The Prothallia of.** By D. H. Campbell (*Ann. Jard. Bot. Buit.*, vol. vii., pp. 69-99; 8 plates).—The prothallium of *Kaulfussia* is larger than that of the other Marattiaceae, but closely resembles it in structure. An endophytic fungus is always present. The antheridia are restricted to the lower surface of the midrib. In their large size, as well as in the larger spermatozoids, they resemble *Ophioglossum*. The development of the embryo is similar to that of the other Marattiaceae. The cotyledon emerges from the upper surface of the prothallium and resembles that of *Ophioglossum* in form and venation. The prothallium of *Gleichenia* possesses a massive midrib. An endophytic fungus is always present. In *G. laevigata* the antheridia occur on both sides of the prothallium; in all other species they are confined to the ventral surface. *G. laevigata* has the largest antheridia, and *G. polypodioides* the smallest. The embryo appears to resemble in its early divisions that of the Polypodiaceae.—S. E. W.



**Light Sense.** By Dr. P. Schürhoff (*Beih. Bot. Centralbl.* xxiii, 1<sup>te</sup> Abth. Heft 1, pp. 14–26; 2 plates).—Finds in six species of *Peperomia* distinct evidence of a light-collecting apparatus. This consists, in some cases, of glandular hairs with the waterstoring cells which belong to them, or of secretory epidermis cells with the hypodermis cell, or of the basal cells of hairs with hypodermis cells. In one case there are papillary epidermis cells.

The light is always reflected upon the chloroplast, sometimes in consequence of the shape of the cell whose upper convex wall functions as a lens, or in other cases because the light rays collected by the lens-shaped upper portion of the cell are dispersed by a crystal of calcium oxalate and so thrown upon the chloroplasts.

Whether these structures are intended merely to condense the light or are really rudimentary light organs like the ocelli of some of the lower animals remains an undecided question.

If they are only light-condensers one would expect the chloroplasts to change position when the light is thrown upon them from below. It was found, by experiment, that they retain their position when the light is thrown on the under surface, which is rather in favour of the theory that they act as ocelli.

The distribution of the crystals would seem to show that the stimulus, if any, is transferred by the prosenchymatous cells of the vascular bundles.—*G. F. S.-E.*

**Lonicera Giralddii** (*Bot. Mag.* tab. 8236).—Nat. ord. *Caprifoliaceae*; tribe *Loniceraceae*; China. Shrub with branches tawny-tomentose when young; leaves lanceolate, 1–3½ inches long; corolla tube ½ inch long, crimson, yellow pubescent without.—*G. H.*

**Mendelism and Cytology** (*Bot. Gaz.* July 1908, pp. 1–34, with 3 plates).—Mr. Reginald Ruggles Gates contributes a detailed study of reduction in *Oenothera rubricaulis*.—*G. H. S.-E.*

**Mercurialis, Ipomoea, and Cuscuta** (*Beih. Bot. Centralbl.*, xxiv., Erste Abth., Heft 1, pp. 83–95).—Herr Friedrich Hilderband records visits of insects to the male flowers of *Mercurialis annua* and yew, but saw none of them on the female flowers. He also describes the extraordinarily sudden opening of the flowers of *Ipomoea grandiflora*, which occurs in the evening after a hot and sunny day. The time of opening in the evening depends upon when the sunlight acted on the buds in the morning. He also gives a list of the host plants upon which *Cuscuta europaea* and *C. lupuliformis* were observed. Both ordinary nettles and even a *Campanula* were attacked by them.—*G. F. S.-E.*

**Monk's Rhubarb.** By Ernst H. L. Krause in Strassburg (*Beih. Bot. Centralbl.*, xxiv., Heft 1, pp. 6–52).—Under the title of “Lapathon and Patience” the author investigates the history of *Rumex patientia*. His conclusions are as follows:—

The Greeks from about 400 B.C. used a *Rumex* which was eaten as a vegetable. This plant seems to have been *Rumex graecus*, which is no longer in cultivation, but wild plants are still collected and used as a vegetable. A polymorphous series of species nearly related to it still exist



in the Near East, and a few of them (besides *graeus*) extend into the Balkans.

About the first century of our era the Romans obtained this vegetable from Greece, but even in the Middle Ages its cultivation had been abandoned, though a tradition of it still existed. The form cultivated in the Netherlands (which escaped the thorough destruction of the lands of the Allemanni during the barbarian invasions) is not *Rumex graeus* but *R. patientia*, which may be a hybrid between the former and some wild species (perhaps *R. crispus*). This is very like the older cultivated plant, but better suited to a European climate. In the beginning of the sixteenth century the Franciscan monks used the roots of *R. patientia* instead of rhubarb, and cultivated it in the monastery gardens. So it came into gardens and into botanical hands. It was soon found to be unsuited for medicinal purposes. *R. alpinus* was used by the apothecaries for a longer period. In England it has either remained over from ancient times or been introduced. It has been eaten as a spinach since the seventeenth century, and has been distributed to many countries.

G. F. S.-E.

**Mutants.** By Dr. Karl Domin (*Beih. Bot. Centralbl.* xxiii. 2<sup>te</sup> Abth., Heft 1, pp. 15-25).—Describes *Potentilla verna* L. mutant *monophylla*, *Primula officinalis* (L.) Hill mutant *horticola*, and *Picea Omorilla* (Panč.) Willk. var. *Fassei* Midloch.

The leaf of the above *Potentilla* has but one leaflet, but it scarcely differs in other respects from *P. verna*. The author considers it to be an atavistic form resembling the original ancestor of *P. verna*.—G. F. S.-E.

**Nigella integrifolia** (*Bot. Mag.* tab. 8245).—Nat. ord. *Ranunculaceae*; tribe *Helleboreae*; Turkestan. Herb annual, 1 foot high; leaves 3-9 palmatifid, lobes 1½-2 inches long; flowers blue, 1 inch diameter.

G. H.

**Nitro-bacterine, an Experiment with.** By C. T. Gimingham, A.I.C.—The following experiment with nitro-bacterine was carried out at Wye College in 1908.

The crops chosen were three varieties of ordinary garden peas and one of broad beans. The object of the experiment was to discover whether the use of the inoculating material under ordinary conditions of culture resulted in an increased yield of marketable produce. The experiment was carried out on two types of soil:—

(1) A soil which had been previously well-trenched and manured, and was prepared and intended for vegetable culture.

(2) A very poor thin soil, just overlying the chalk and very deficient in organic matter. This was dug over just before sowing.

In the case of soil (1) it was hardly to be expected that much good would result from inoculation unless the bacteria introduced should prove of much greater virulence than those already present in the soil; for in this case there was a fair amount of nitrogen present in the soil, and, moreover, peas had recently been grown there with success.

Soil (2), however, seemed to be just the type of soil on which inoculation should prove of value. No leguminous crop had been grown

there for many years, and there was extremely little organic matter present; moreover, lime and the necessary mineral foods were present in sufficient quantity. It would seem to fulfil the conditions mentioned on p. 10 of Professor Bottomley's "Seed and Soil Inoculation," under which inoculation is stated to be *necessary*.

No manures were used in connection with the trial.

On each type of soil four rows of each variety were sown, each row being 21 feet long, and in every case a row sown with inoculated seed alternated with a row sown with untreated seed. Thus at the end of the experiment the weights of produce from two rows inoculated and two rows uninoculated of each variety were obtained. The varieties of peas employed were Carter's 'Eight Weeks,' 'Early Morn,' and 'Yorkshire Hero.' The culture fluid was prepared in the laboratory with all care to prevent unnecessary contamination and precisely according to the directions given. The temperature was regulated correctly, and the liquid used for the inoculation of the seed as soon as it appeared sufficiently cloudy. The inoculation was performed by immersing each lot of seed, contained in a small muslin bag, into the liquid until thoroughly wet. The seed was then spread out in a cool shady place until quite dry and then planted, the same amount of seed being used for planting each row.

At about the time of flowering plants here and there were taken up from corresponding rows, and their roots examined with regard to the formation of nodules. Apparently throughout, nodules were formed quite as abundantly on the uninoculated plants as on those inoculated. No differences were observable at any period between corresponding rows on the same ground, whether with regard to general growth or to the time of coming to maturity.

The following tables give the results obtained, showing the total weight of pods from each row expressed in grams. (The rows of 'Eight Weeks' peas on the good soil were neglected, as just before picking they were somewhat damaged by pigeons):—

#### SOIL MANURED AND TRENCHED.

| Variety.         | Seed inoculated. |        |        | Seed not inoculated. |        |        | Increase or decrease. |
|------------------|------------------|--------|--------|----------------------|--------|--------|-----------------------|
|                  | Row 1.           | Row 3. | Total. | Row 2.               | Row 4. | Total. |                       |
|                  | Gms.             | Gms.   | Gms.   | Gms.                 | Gms.   | Gms.   | Gms.                  |
| Early Morn .     | 3,838            | 4,172  | 8,010  | 4,461                | 5,428  | 9,889  | - 1,879               |
| Yorkshire Hero . | 7,107            | 7,188  | 14,295 | 7,095                | 7,685  | 14,780 | - 485                 |
| Broad Beans .    | 5,715            | 6,376  | 12,091 | 6,806                | 6,336  | 13,142 | - 1,051               |

#### POOR SOIL UNMANURED.

| Variety.         | Seed inoculated. |        |        | Seed not inoculated. |        |        | Increase or Decrease. |
|------------------|------------------|--------|--------|----------------------|--------|--------|-----------------------|
|                  | Row 1.           | Row 3. | Total. | Row 2.               | Row 4. | Total. |                       |
|                  | Gms.             | Gms.   | Gms.   | Gms.                 | Gms.   | Gms.   | Gms.                  |
| *Eight Weeks .   | 3,216            | 3,274  | 6,490  | 2,874                | 3,252  | 6,126  | + 264                 |
| Early Morn .     | 2,740            | 2,551  | 5,291  | 3,056                | 2,638  | 5,694  | - 403                 |
| Yorkshire Hero . | 5,660            | 5,437  | 11,097 | 5,908                | 5,852  | 11,760 | - 663                 |
| Broad Beans .    | 4,450            | 4,648  | 9,098  | 5,694                | 4,733  | 10,427 | - 1,329               |

It will be seen that in only one case \* is the total weight of the produce from the two inoculated rows of any variety greater than that from the two uninoculated rows. The weights of pods of the various rows of each variety show, indeed, remarkably little variation when it is remembered that a difference of 250 grams represents only about a handful of pods.

There was no evidence to show that the slightest benefit had been obtained by the use of "Nitro-bacterine" on either type of soil. The experiment was not on a large scale, but it indicates the kind of results to be expected from the use of this material under ordinary garden conditions in this country, and serves to confirm very many results obtained last summer.—C. T. G.

**Nuts, and their uses as food.** By M. E. Jaffa (*U.S.A. Dept. Agr. Farm., Bull.* 332; Oct. 1905).—Nuts are becoming more important as an article of food in the States. The native kinds are being improved, and foreign more widely cultivated.

Nuts contain much fat and little water, the richest being the pecan—70.7 per cent. of fat. The concentrated nature of the food is probably the reason for their being considered indigestible, and nut protein is slightly less digestible than that of meat, but this may be remedied by sufficient mastication. The water in nuts is 3 to 5 per cent. compared with 50 to 70 per cent. in meat.

In general, nuts rich in protein and fat (brazil-nut, walnut, pecan and cocoa-nut) should be used with carbohydrate foods, such as bread, fruit, and green vegetables; whereas those containing starch and sugar (chestnuts, &c.) should be eaten with meat, milk, cream and eggs.

Nuts should be used as a staple food, and not merely as an addition to a hearty meal, but a nut and fruit diet is not recommended to the majority of mankind in place of the usual mixed diet.

Oily nuts (not containing much starch) such as walnuts, almonds, filberts and brazil-nuts are useful in cases of diabetes, in the form of meal and flour. Nut butters (made from wasted peanuts) are much used by vegetarians, but they become rancid very soon. They are not identical with cocoa butter, or cocoa-nut butter. Nut milk also differs from milk of cocoa-nut. The former made from a species of *Canarium* (seed of the Chinese olive) or Java almond, is used with some success as an emulsion or infants' food.

Many sweetmeats are made from nut products.

Among the Tuscan peasants, chestnut flour is largely used in the form of porridge, cakes and bread. Acorns and horse-chestnuts are used by American Indians as food, after a preliminary process of leaching, to remove tannin and poisonous matters.

Nuts are not economical as food compared with meat, with the exception of peanuts. Ten cents spent on these will purchase twice as much protein and six times the energy as the same amount spent on steak. Peanuts and dried beans supply more protein and energy than any other food.

Amongst the less well-known 'nuts' are the following:—

Pinenuts—used in India, Italy and Southern Europe.



Lichi of China—a raisin-like fruit surrounded by a shell.

Ginkgo of China (fruit of maidenhair tree)—nearly always used cooked.

Water chestnut of Asia (*Trapa bispinosa*)—seed shaped like two horns.

Another water chestnut (*Eleocharis tuberosa*)—the corm or bulb is eaten.

Seed of Chinese olive (*Canarium*)—oily but palatable.

Another species of *Canarium* (Java almond)—used to make emulsion for infants' food.

Candle-nut of Tropics—eaten after being thoroughly dried.

Paradise-nut of South America.

Cream-nut of South Africa.

True 'Butternut' of the Tropics.

Cashew nut of the Tropics—must be roasted or is poisonous.

Kingsland Chestnut.

The Tabebuia from Zanzibar—seeds of a pumpkin-like fruit, oily and fairly palatable—is grown at Porto Rico.—*C. H. L.*

**Oak Disease (*Oidium quercinum*).** By P. Heriot and L. Daniel (*Le Jardin*, vol. xxii. No. 517, p. 265; September 5, 1908).—In 1907-08 the oaks in France were attacked by a new pest, *Oidium quercinum*, Thiénsen, which covers the young shoots with a white powder, consisting of ovoid spores (conidia) arranged in chains like those attributed to other Oidia. Up to September 1908 (date of article), the nature of the fungus had not been detected, but it seems probable that it is *Microsphaera alni* which abounds on oak-leaves in the United States, and has recently been reported from Geneva. Most species of Oak appear to be attacked by it, e.g. *Quercus sessiflora*, *pubescens*, *Toza*, *Ilex*; it has not yet been detected on *Q. Suber*, and *coccifera*. It is suggested that the disease may have originated in imported American oaks, but no observations have been made as to whether these were the first attacked. No adequate remedy is known, since it is impossible to cover a forest with sulphur like a vineyard.

M. Daniel in an interesting note points out that the trees beset by the parasite are those which have been recently pollarded. In the Departments of which he writes this takes place every seven years. Some trees are completely pollarded, others are allowed to retain a central shoot, while those destined for the carpenter are not trimmed at all, but are allowed to develop freely. Now the fungus takes complete possession of trees lopped in the previous autumn, when the mutilated tissues contain a superabundance of water with no foliage to carry it off, while in proportion as new growth has been made and there is a return to the normal proportions of trunk and boughs, the parasite has so much the less effect. The moral, according to M. Daniel, is obvious, and the remedy lies in more judicious foresting.—*F. A. W.*

**Odontoglossum Leaf-spot.** By M. C. Potter, M.A., F.L.S. (*Gard. Chron.* 1909, i. p. 145).—A full account, with four figures of *O. Uro-Skinneri* affected with this disease.—*G. W.*

**Olearia.** By S. Mottet (*Le Jardin*, vol. xxii. No. 517, p. 260; September 5, 1908, 3 figs.).—The genus *Olearia*, known to us for the most

part by *O. Haastii* only, includes over eighty species, but only three or four of these are worth cultivating. *O. macrodonta* (syn. *dentata*) is an interesting plant, with crinkled thorny leaves like a Holly, and corymbs of single white flowers, inserted on long peduncles at the apex of the previous year's growth. It is, however, only half-hardy. *O. Eurybia Gunniana* is comparatively hardy, and from its dwarf habit well suited for the rock garden. *O. Forsteri* resembles *O. macrodonta*; *O. Traversii* is much taller, with shining oval green leaves, woolly on the under-surface, numerous white flowers on slender pedicels forming a dense corymb; *O. furfuracea*, *O. insignis*, *O. ramulosa*, and *O. nitida* may also be mentioned. All these species come from New Zealand, and all are easily propagated by cuttings of the young shoots at the end of the summer. Strike in light soil, under bell-glasses, and shaded.—*F. A. W.*

**Oligobotrya Henryi** (*Bot. Mag.* tab. 8238).—Nat. ord. *Liliaceae*; tribe *Polygonateae*; China. Herb, stem 3 feet high; leaves sessile, ovate-oblong to 2 inches broad; raceme terminal; perianth white or pale yellow, or (var. *violacea*) with a violet tube,  $\frac{1}{2}$  inch long.—*G. H.*

**Olive Culture, Dry-Land, in Northern Africa.** By Thomas H. Kearney (*U.S.A. Dept. Agr., Bur. Pl. Ind., Bull.* 125, 1908; illustrated).—The use of trees as a drought-resisting crop in the dry lands of the States has up till now not been fully considered. The olive would seem especially suitable for cultivation in the arid parts of California, Texas, and Arizona, to judge by the experience of the Old World. Although now practically a sandy desert, there is no doubt that Algeria and Tunis, before the Arab conquest, used to support large and flourishing populations, whose wealth was derived in the early centuries of the Christian era from olive orchards and the production of oil.

On the east coast olive culture never completely disappeared. Sfax, a flourishing seaport town, is surrounded by olive orchards to a distance of twenty or more miles, and contains many crushing mills, both native and European. The trees are set out about 70 feet apart each way, and pruned to admit the greatest amount of air and sunshine.

The rainfall averages 9 inches a year, and is often less for a number of years in succession, so that irrigation is out of the question.

The ground is kept quite clean when the trees are once in bearing.

They begin to bear productively when about ten years old, increasing till twenty-five years, when they should be in full bearing, and with good treatment they so remain till fifty years, when they begin to decline.

The average yield of oil from each tree in full bearing is about six gallons.

The best means of cultivation is that by contract with native proprietors, more economical and effectual than by European management.

(The summary at end of pamphlet is instructive).—*C. H. L.*

**Orchard Survey of Jackson County.** By C. I. Lewis, S. L. Bennett and C. C. Vincent (*Oregon Agr. Exp. St. Bull.* 101).—To those who are interested in fruit culture this work is of special value. From a small beginning orcharding in Jackson County has had a wonderful development in the past fifteen years, there being at present 473

orchards containing 9,675 acres. The methods of cultivation, soils, irrigation, pruning and preparing the fruit for market are all clearly related. Yellow Newtown, Spitzenburg, and Jonathan would appear to be the most widely grown amongst apples, while of pears Doyenné du Comice, Bartlett, and Beurré Bosc are the kinds most commonly cultivated.

As regards prices these have been steadily on the increase for the past few years, while with pears the increase in value has been phenomenal.—A. D. W.

**Orchid Portraits.**—The following orchids have been figured recently:—

- |                                                    |                                                                                |
|----------------------------------------------------|--------------------------------------------------------------------------------|
| Angraecum Augusti . . .                            | <i>Gard. Chron.</i> 1909, i. p. 89.                                            |
| A. sesquipedale . . .                              | <i>Gartenfl.</i> 1909, p. 55, fig. 4.                                          |
| *Brassocattleya Cliftonii . .                      | <i>Gard. Chron.</i> 1909, i. p. 34, fig. 23.                                   |
| *B.-c. Digbyano Mendelii perfecta .                |                                                                                |
| *Brassocattlaelia Cooksonii . .                    |                                                                                |
| Bulbophyllum Dayanum . .                           | <i>Gard. Chron.</i> 1909, i. p. 194, fig. 82.                                  |
| B. lemniscatoides . . .                            | <i>Gard. Chron.</i> 1909, i. p. 68, fig. 38.                                   |
| *Calanthe × Angela . . .                           | <i>Journ. Hort.</i> 1909, i. p. 3.                                             |
| Calypso borealis . . .                             | <i>Country Life</i> , 1909, p. 194.                                            |
| Cattleya intermedia monstrosa .                    | <i>Orch. Rev.</i> 1909, p. 41, fig. 4.                                         |
| C. Loddigesii var. Harrisoniae .                   | <i>Journ. Hort.</i> 1909, i. p. 273.                                           |
| *C. × Maggie Raphael, Westonbirt<br>var. . . . .   |                                                                                |
| C. Percivaliana, Charlesworth's var.               | <i>Gard. Mag.</i> 1909, p. 43.                                                 |
| *C. × Robert de Wavrin . . .                       |                                                                                |
| *C. Schröderae var. Alexandra James                |                                                                                |
| *C. Schröderae var. Irene . . .                    |                                                                                |
| *C. Schröderae var. Mrs. F. Sander                 |                                                                                |
| *C. Schröderae var. The Baron . .                  |                                                                                |
| *C. Trianaei var. Grand Monarch .                  |                                                                                |
| *C. Trianaei var. Mooreana . . .                   |                                                                                |
| C. Warscewiczii var. Sanderiana .                  | <i>Journ. Hort.</i> 1909, i. p. 69.                                            |
| Chondropetalum Fletcheri . . .                     | <i>Gard. Chron.</i> 1909, i. p. 9, fig. 12.                                    |
| Cynoches densiflorum . . .                         | <i>Orch. Rev.</i> 1909, p. 104, fig. 9.                                        |
| *C. peruvianum, Tracy's var. . .                   |                                                                                |
| C. maculatum . . . . .                             | <i>Gard. Chron.</i> 1909, i. p. 26, fig. 19.                                   |
| C. pentadactylon . . . . .                         | <i>Gard. Chron.</i> 1909, i. p. 27, fig. 20.                                   |
| C. Warscewiczii . . . . .                          | <i>Gard. Chron.</i> 1909, i. p. 29, fig. 21.                                   |
| Cymbidium × eburneo-Lowianum                       | <i>Gard. Mag.</i> 1909, i. p. 5.                                               |
| *C. × Woodhamsianum, Orchid-<br>hurst var. . . . . |                                                                                |
| Cypripedium × Antinous . . .                       | <i>Gard. Mag.</i> 1909, i. p. 91.                                              |
| C. × Bianca superbum . . .                         | <i>Journ. Hort.</i> 1909, i. p. 25.                                            |
| *C. × Bridgei magnificum . . .                     | <i>Journ. Hort.</i> 1909, i. p. 229; <i>Gard.</i><br><i>Mag.</i> 1909, p. 184. |
| *C. × Curtmannii . . . . .                         |                                                                                |
| C. × Euryades, New Hey Hall var.                   |                                                                                |
| C. × Earl of Tankerville . . .                     | <i>Gard. Chron.</i> 1909, i. p. 101, fig. 49.                                  |



- |                                                            |                                                                                                                                                                                                           |
|------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| C. insigne Lagerae . . . . .                               | <i>Orch. Rev.</i> 1909, p. 40, fig. 3.                                                                                                                                                                    |
| *C. × Leander, Exhims var. . . . .                         |                                                                                                                                                                                                           |
| C. × Mrs. Wm. Mostyn . . . . .                             | <i>Journ. Hort.</i> i. p. 157.                                                                                                                                                                            |
| *C. × Our Queen . . . . .                                  | <i>Gard. Mag.</i> 1909, p. 192.                                                                                                                                                                           |
| C. pubescens . . . . .                                     | <i>Country Life</i> , 1909, p. 194.                                                                                                                                                                       |
| C. × Tracyanum . . . . .                                   | <i>Gard. Mag.</i> 1909, i. p. 260.                                                                                                                                                                        |
| Dendrochilum glumaceum validum                             | <i>Orch. Rev.</i> 1909, p. 81, fig. 8.                                                                                                                                                                    |
| *Dendrobium × Lady Colman . . . . .                        |                                                                                                                                                                                                           |
| *D. × Schneiderianum, Westonbirt<br>var. . . . .           | <i>Gard. Chron.</i> 1909, p. 251; <i>Journ.<br/>Hort.</i> 1909, i. p. 319.                                                                                                                                |
| D. speciosum . . . . .                                     | <i>Gard. Chron.</i> 1909, i. p. 219, fig. 94.                                                                                                                                                             |
| *Epilaelia Lionetii . . . . .                              |                                                                                                                                                                                                           |
| Eria hyacinthoides . . . . .                               | <i>Bot. Mag.</i> t. 8229.                                                                                                                                                                                 |
| Habenaria dilatata . . . . .                               | <i>Country Life</i> , 1909, p. 194.                                                                                                                                                                       |
| Laeliocattleya × Elinor . . . . .                          | <i>Gard. Chron.</i> 1909, i. p. 120.                                                                                                                                                                      |
| L.-c. × Felicia . . . . .                                  | <i>Gard. Chron.</i> 1909, i. p. 100, fig. 48;<br><i>Gard. Mag.</i> 1909, p. 101.                                                                                                                          |
| *L.-c. × Fred. Boyle var. Ker-<br>chovae . . . . .         | <i>Gard. Mag.</i> 1909, i. p. 293.                                                                                                                                                                        |
| *L.-c. × Goldcrest . . . . .                               |                                                                                                                                                                                                           |
| *L.-c. × Goldfinch superba . . . . .                       |                                                                                                                                                                                                           |
| *L.-c. Lustre var. gigantea . . . . .                      | <i>Gard. Chron.</i> 1909, i. p. 168.                                                                                                                                                                      |
| *L. Pizarro, Westonbirt var. . . . .                       | <i>Gard. Chron.</i> 1909, i. p. 232.                                                                                                                                                                      |
| Lycaste Skinneri . . . . .                                 | <i>Garden</i> , 1909, i. p. 99.                                                                                                                                                                           |
| Masdevallia ignea . . . . .                                | <i>Gard. Mag.</i> 1909, i. p. 283.                                                                                                                                                                        |
| Macodes Petola . . . . .                                   | <i>Orch. Rev.</i> 1909, p. 73, fig. 6.                                                                                                                                                                    |
| *Miltonia Bleuana, Sander's var. . . . .                   |                                                                                                                                                                                                           |
| *Odontioda × Bradshawiae, Cook-<br>son's var. . . . .      | <i>Gard. Chron.</i> 1909, i. p. 174, fig. 73;<br><i>Gard. Mag.</i> 1909, p. 211; <i>Journ.<br/>Hort.</i> 1909, i. p. 252; <i>Garden</i> ,<br>1909, i. p. 137; <i>Orch. Rev.</i> 1909,<br>p. 113, fig. 10. |
| O. × chelsiensis . . . . .                                 | <i>Orch. Rev.</i> 1909, p. 48, fig. 5;<br><i>Journ. Hort.</i> 1909, i. p. 47;<br><i>Gard. Mag.</i> 1909, p. 70.                                                                                           |
| O. × Goodsoniae. . . . .                                   | <i>Gard. Chron.</i> 1909, i. p. 195, fig. 83.                                                                                                                                                             |
| *O. × Ernest Henry . . . . .                               |                                                                                                                                                                                                           |
| O. × Keighleyensis . . . . .                               |                                                                                                                                                                                                           |
| *O. × Lutetia . . . . .                                    | <i>Gard. Mag.</i> 1909, p. 159; <i>Journ.<br/>Hort.</i> i. p. 207.                                                                                                                                        |
| *Odontoglossum × ardentissimum<br>var. Phoebe . . . . .    | <i>Gard. Chron.</i> 1909, i. p. 132, fig. 57;<br><i>Gard. Mag.</i> 1909, p. 134; <i>Journ.<br/>Hort.</i> 1909, i. p. 137.                                                                                 |
| *O. crispum Angela . . . . .                               |                                                                                                                                                                                                           |
| O. crispum Fowlerianum . . . . .                           | <i>Gard. Chron.</i> 1909, i. p. 211, fig. 90.                                                                                                                                                             |
| O. crispum × anthotes var. Mrs.<br>F. M. Ogilvie . . . . . | <i>Gard. Chron.</i> 1909, i. p. 258, fig. 110.                                                                                                                                                            |

- O.  $\times$  crispo-Harryanum . . . *Gard. Chron.* 1909, i. p. 133, fig. 58 ;  
*Gard. Mag.* 1909, p. 144.
- \*O.  $\times$  Dreadnought . . . . .
- \*O.  $\times$  loochristiense aureo-fulvum .
- \*O.  $\times$  Magali Sander . . . . . *Gard. Chron.* 1909, i. p. 37, fig. 25 ;  
*Gard. Mag.* 1909, i. p. 33.
- \*O.  $\times$  percultum, Cookson's var. . .
- O.  $\times$  Rolfeae . . . . . *Gartenfl.* 1909, p. 57, t. 1580.
- O. Rossi majus . . . . . *Journ. Hort.* 1909, i. p. 343.
- O.  $\times$  Smithii . . . . . *Orch. Rev.* 1909, p. 80, fig. 7.
- \*O.  $\times$  Sylvia, Westonbirt var. . .
- \*O.  $\times$  Theodora . . . . . *Gard. Mag.* 1909, i. p. 339 ; *Gard.*  
*Chron.* 1909, i. p. 269, fig. 115.
- O.  $\times$  tripudians  $\times$  Pescatorei
- Charlesworthii . . . . . *Orchis*, 1909, p. 10, fig. 1.
- O. Wyonianum . . . . . *Gard. Chron.* 1909, i. p. 211, fig. 89.
- Orchis rotundifolia* . . . . . *Country Life*, 1909, p. 194.
- Oncidium corynephorum* . . . . . *Journ. Hort.* 1909, i. p. 91.
- O. Kramerianum . . . . . *Gard. World*, 1908, p. 779.
- O. sarcodes . . . . . *Journ. Hort.* 1909, i. p. 92.
- Paphiopedilum niveum* var. *Gloria*
- Mundi . . . . . *Orch. Rev.* 1909, p. 9, fig. 1.
- Phalaenopsis Schilleriana* . . . . . *Journ. Hort.* 1909, i. p. 367.
- \**Sophrocattleya Thwaitesae* . . . . . *Journ. Hort.* 1909, i. p. 295.
- \**Sophrocattlaelia Olive* . . . . .
- \**S.-c.-l. Marathon* var. *Vesuvius* . . . . . *Journ. Hort.* 1909, i. p. 113.
- Spiranthes Romanzoffiana* . . . . . *Country Life*, 1909, p. 194.
- Vanda coerulea* . . . . . *Orch. Rev.* 1909, p. 17, fig. 2. ;  
*Gard. Chron.* 1909, i. p. 264.
- V. Watsonii* . . . . . *Rev. Hort. Belge*, 1909, p. 90.
- G. W.

\* A painted portrait of those having an asterisk prefixed is preserved in the Royal Horticultural Society's collection.

### Orchids and their commensal fungi : Evolution in Symbiosis.

By N. Bernard (*Ann. Soc. Nat.*, vol. ix., No. 1, pp. 1-64 ; 12 figs.).—In the majority of orchids, symbiosis is intermittent in the adult state, but is absolutely necessary for germination. In the more perfect degrees of symbiosis illustrated among orchids, e.g., *Neottia Nidus-avis*, not only will the seeds refuse to germinate in the absence of the fungus, but the orchid cannot live without its symbiotic fungus.

*Rhizoctonia repens*, *R. mucoroides*, and *R. lanuginosa* were obtained from the roots of orchids.—*S. E. W.*

**Orchids from Samoa, New.** By F. Kränzlin (*Not. König. Bot., Berlin*, No. 44, pp. 109-111).—*Bulbophyllum praealtum*, *Dendrobium Vaupelianum*, *Eria curvipes*, and *Calanthe Vaupeliana* occur in Samoa.

*S. E. W.*

**Orchids in the Rockies.** By Julia W Henshaw (*Country Life*, 1909, p. 194).—Mention is made of twenty-three species of Orchidaceae

in the Rocky and Selkirk mountains of Canada. Five excellent photographs are given.—*G. W.*

**Packing Fruit for Export.** By J. G. Turner (*Jour. Agri. Victoria*, February 1908).—The following are varieties of fruit found most suitable for export from Victoria, Australia.

*Apples*.—Jonathan, Cleopatra (or New York Pippin), Munroe's Favourite (or Dunn's Seedling), London Pippin (or Five Crowns), Statesman (or Chandler), Rome Beauty, Newtown Pippin, Esopus Spitzenberg, and Ribston Pippin.

*Pears*.—Vicar of Winkfield, L'Inconnue, Winter Nelis, Josephine de Malines, Broom Park, Eyewood, and Uvedale's St. Germain.

The cost of packing, shipping and selling a bushel case is given as follows:—

|                                             | s. | d. |
|---------------------------------------------|----|----|
| Cases, best kauri planed per case . . . . . | 1  | 1  |
| Wrappers . . . . .                          |    | 1  |
| Grading, packing and nailing . . . . .      |    | 2  |
| Rail freight . . . . .                      |    | 3  |
| Ocean freight . . . . .                     | 2  | 10 |
| Insurance and commission . . . . .          |    | 7  |
| Supervision . . . . .                       |    | 3  |
| Total per case                              | 5  | 3  |

The measurement of the bushel box inside is 18 × 14 × 8½ inches containing 2,236½ cubic inches.

Pears have been successfully packed in trays, one layer in each tray three of these trays are then cleated together to make a single package; in some cases cardboard divisions are employed. Ventilation holes are bored through the cases and cardboard shelves, to allow the passage of air. Picking, cooling, grading, packing and the branding of the cases are described.—*C. H. H.*

**Paraffin, Action of, on Tree Roots and on Soils.** By the Duke of Bedford, K.G., and Spencer U. Pickering, F.R.S. (*Woburn, Tenth Report*, 1909, pp. 22-25).—Trees sprinkled with a quart of various kinds of paraffin when not in leaf showed no ill effects as regards their growth and general condition, while the crops on trees so treated were the best on the farm. Apart from the question of possible direct benefit, the results of the experiments suggest the possibility of treating the roots and the soil for various diseases and insect pests by means of paraffin.—*A. P.*

**Paraffin, Spraying Trees in Leaf with.** By the Duke of Bedford, K.G., and Spencer U. Pickering, F.R.S. (*Woburn, Tenth Report*, 1909, pp. 13-21).—The heavier oils, such as solar distillate, eventually killed both leaves and branches, while the lightest oils, such as petrol, scorched the leaves immediately, but the branches recovered. Those of intermediate character, such as the best lighting oils, did very little damage to the foliage.—*A. P.*

**Peach Aphis (*Myzus persicae*, Sulz.).** By E. P. Taylor (*Jour. Ec. Entom.*, I. (1908), Pt. 2, pp. 83-91).—This aphid, which attacks peach in Europe, has also been found in America on nectarine, plum, prune, cherry,



choke-cherry, sand-cherry, pear, apple, willow, rose, turnip, rape, cabbage, tomato, potato, *Malvastrum*, dock, *Amaranthus*, mustard, shepherd's purse, *Antirrhinum*, carnation, rhubarb and egg-plant. The eggs are shiny black, small and oval, and are to be found near the tips of the shoots. The aphides are at first of a dark green colour and later assume shades of pink and salmon. As with most aphides the forms hatched from the eggs are viviparous and produce numbers of young. After feeding on the leaves, &c., a large proportion of them acquire wings, and about the beginning of June (in Colorado) desert the peach for some of the other plants mentioned above, returning to the peach in September or October. Larvæ of *Syrphus* flies and lace-wings and ladybirds prey on the aphides, and a small hymenopterous parasite destroys large numbers, while various birds feed upon them. The whole life history is very carefully outlined in the paper. The best results in controlling the pest were obtained by spraying with paraffin emulsion containing 5 per cent oil, Scalecide diluted 1 part to 20 parts cold water, or tobacco decoction made by steeping 1 lb. of leaf tobacco or 2 lb. strong tobacco dust in 4 gallons water, *just before the buds burst*. It is recommended that all prunings should be burned.—*F. J. C.*

**Peach, Apricot, and Plum Kernel Oil Manufacture in the United States.** By F. Rabak (*U.S.A. Dept. Agr., Bur. Pl. Ind., Bull.* 133, October 1908).—Large quantities of stoned apricots and peaches and a certain amount of stoned plums are annually sold in the United States. The kernels of all these fruits are almost identical chemically with those of the sweet and bitter almonds, from which the almond oil of commerce is extracted, and as apricot stones from America are already exported abroad, and the extracted oil returned to America as pure almond oil, it is suggested that a native industry might be created, and the American demand for almond oil be supplied from the home orchards.

*M. L. H.*

**Peach Die Back** (*Dep. Agr. N.Z., 16th Report, 1908, p. 112*).—This disease was formerly attributed to *Clasterosporium carpophilum*; but during studies of 'Peach-scab' it has become apparent that the fungus is identical with *Coryneum Beyerinckii*. Spraying with Bordeaux mixture soon after the leaves have fallen is followed with good effects. When infection has been established the spores are developed in large numbers at the first sign of spring growth, and if the spraying is delayed until this period considerable damage through "die back" will be experienced.—*M. C. C.*

**Peatmosses, Poisoning in.** By Alfred Dachnowski (*Bot. Gaz.*, xlv., August 1908, pp. 130-143; with 6 figures).—The author has carried out some very interesting experiments on the toxic property of bogwater and bogsoil. He alludes to the great importance of the reactions upon habitat of the plants themselves. He collected samples of bogwater from a small "bog island" (apparently a sphagnum and cottongrass swamp with an outer zone of alder, willow and *Acer rubrum*).

*Marchantia gemmae*, wheat, Indian corn, and several other plants were then grown in this bogwater after it had been variously treated. In one

series the water was aerated, in another treated with dry calcium carbonate, in another shaken with lampblack and filtered; other sets were grown in the untreated bogwater and in an extract (4 gm. of bogsoil in 400 ccm. of distilled water).

The experiments point to an injurious effect of some water-soluble substance in the bogwater which can be corrected by a method of aeration and by the use of calcium carbonate and lampblack. This is more marked in the sphagnum than in the maple-alder zone.

Those plants which grew in the bogsoil extract were stunted in root-formation, whilst their leaves were reduced in area, thicker, and with revolute margins—that is, distinctly xerophilous in character. This he explains as due to a reduced transpiration current in consequence of the poisonous character of the soil. The beneficial effect of small doses of poisons comes out in some of the  $\text{CaCO}_3$  and carbon-black solutions. *Phaseolus* seedlings grown in these closely resembled similar cultures in a .0001 strychnin or atropin sulphate solution. The width of the annual rings of wood in *Acer rubrum*, both from the ordinary woodlands and from the bog island zone already mentioned, was measured and tested biometrically. The mode was 3 mm. width from the bog island, and only 2 mm. from the ordinary woods. There were also very marked differences in mean, standard deviation, and coefficient of variability. The author seems to explain this also by the stimulation due to minute proportions of poisonous solution in the bogwater.

We find, however, the following sentence: "It may be readily questioned whether part of the response arises from a deficiency of oxygen in the soil." This, of course, is the usual explanation of the peculiarities of peat-floras, but whether the author means by this sentence to admit this explanation or not is not particularly obvious.—*G. F. S.-E.*

**Pecan, Cultivation of.** By Prof. H. S. Van Deman (*U.S.A. Stn. Hort. Soc., Louisiana, Ann. Rep.* 1908 : pp. 18-94).—The author considers the pecan to be the most valuable orchard tree for cultivation in Louisiana. He recommends that they should be grown one hundred feet apart and cotton, Irish potatoes, or corn grown between them.—*F. J. C.*

**Pentadesma Kerstingii, Seed of.** (*Not. König. Bot., Berlin*, No. 44, p. 102).—These seeds are rich in fat.—*S. E. W.*

**Pinus Bungeana** (*Bot. Mag.* tab. 8240).—Nat. ord. *Coniferae*; tribe *Abietineae*; North China. Tree 60-100 feet high, crown pyramidal or ovoid; leaves in threes; cone when mature  $1\frac{1}{2}$ -2 inches long; scales rhomboidally thickened at the tips.—*G. H.*

**Pitophora.** By A. Ernst (*Ann. Jard. Bot. Buit.*, vol. vii., pp. 18-55; 4 plates).—The growth, development, and structure of *Pitophora sumatrana* are described.—*S. E. W.*

**Plants containing Cyanogen derivatives.** By A. W. K. De Jong (*Ann. Jard. Bot. Buit.*, vol. vii., p. 1-17).—The leaves of *Pangium edule* contain the glucoside gynocardine, which is also present in the seeds of *Gynocardia odorata*. The glucoside is decomposed by the



action of an enzyme liberating hydrocyanic acid. The leaves also contain a large proportion of the hydrocyanic acid in the free state.

The leaves of *Phaseolus lunatus* contain the glucoside phaseolunate ( $C_{10}H_{17}O_6N$ ).—*S. E. W.*

**Podocarpus, Staminate Cone and Male Gametophyte of.** By L. Lancelot Burlingame (*Bot. Gaz.*, xlvii., September 1908, pp. 161-178).—There are two primary prothallial cells, which may form as many as eight prothallial cells; also both stalk and body cells, and 12 to 24 chromosomes.—*G. F. S.-E.*

**Polypodium Pteropus, Bl.** By A. Ernst (*Ann. Jard. Bot. Buit.*, vol. vii., pp. 103-143; 3 plates).—The influence of environment on the structure and growth of *Polypodium Pteropus* (which was found growing submerged at the bottom of a temple tank at Lanbok, in the garden of the former Sultan of Lingsar), is described.—*S. E. W.*

**Potash, Experiments with Feldspathic Rock as a Source of.** By B. L. Hartwell and F. R. Pember (*U.S.A. Exp. Stn. Rhode I., Bull.* 129; June 1903).—The results of water culture experiments with wheat seedlings in which ground feldspathic rock (of a fineness that it would pass a sieve with 200 meshes to the linear inch) took the place of potassium chloride in some of the bottles. Other experiments were performed in pots. In neither case did the finely ground rock appear to provide an amount of potash sufficient to justify the investigators in recommending its use as fertilizer even upon an experimental scale.—*F. J. C.*

**Potato, Brown Spots in Tuber.** By W. J. Morse (*U.S.A. Exp. Stn. Maine. Rept.* 1907, pp. 318-319; figs.).—Brown spots in the flesh of the potato are described. They were not apparently due to the presence of any fungi or bacteria. Some varieties appear to be more susceptible than others and the disease is looked upon as constitutional.—*F. J. C.*

**Potato Diseases in San Joaquin County, California.** By W. A. Orton (*U.S.A. Dep. Agr. Circ.* 23; January, 1909).—The principal cause of the marked decrease in the yield of old potato land is the presence of a fungus disease, the wilt or dry rot (*Fusarium oxysporum*, Schrl.). The leaves assume a dull unhealthy appearance, with a rolling or curling of the margins. Gradually the tops wither or fall over; the diseased plants are easily pulled up, the roots partly dead and brittle. The fungus appears on them as a white or pink mould. When the underground portion of the stem is cut across, a pronounced brown discoloration is visible. The brown stain is also found in the branches leading to the tubers. When the potatoes are dug there is rarely any external evidence of disease. When infected potatoes are stored in a warm temperature, dry rot soon appears.—*M. C. C.*

**Potato Experiments.** (*Jour. Dep. Agr. Vict.* Sep. 1908, pp. 559-575).—Immature potato seed in the case of 'Beauty of Hebron' gave better results than were obtained from seed perfectly ripe and well matured. Change of seed from one district of the State to another did not, however, appear to affect the productiveness.—*C. H. H.*



**Potato, Improvement of the.** By Edward M. East (*U.S.A. Exp. Stn., Illinois, Bull.* 127, pp. 375-456).—The author considers that promising strains may perhaps be isolated from *S. Commersonii*, but not from any of the other wild species of potato. Even Commerson's potato has so far not proved satisfactory in the United States. After a short discussion of the historical facts dealing with the introduction of the potato into Europe he points out that certain varieties do not produce flowers or else have infertile pollen which makes the introduction of new strains by crossing or raising from true seeds a difficult and uncertain process. Ninety per cent. of the modern United States crop is from varieties which have been produced by scientific breeders such as the late E. S. Carman. The differences in yield of these varieties is very great, varying from 18·7 ('E. Six Weeks') to 137·7 bushels ('Green Mountain') of marketable tubers per acre. The yield is in proportion to the growing season, provided that there is entire maturity before frost. In general, luxuriant vegetation is a sign of great productiveness, but in some varieties excessive vegetative growth is opposed to tuber formation. Rapid growth at first increases the yield, which is affected also by the weight of the seed-piece, by the amount of sunlight (darkened glass, clear glass, and open air as 1 : 5 : 11), by differences of age and of vigour in eyes when sprouted before planting, and by depth of planting. Drying the seed tubers, up to a loss of 20 per cent. moisture, also increases the yield.

The author summarizes a large number of experiments dealing with the inheritance of characters when tubers are specially selected. Many of these experiments did not result in definite conclusions, for seasonal, climatic, and local soil conditions have "a tremendous effect."

It is, however, quite clear that tubers of a plant which has a large yield tend to be extremely productive. Thus in one variety large seed tubers of a productive mother plant gave a crop of 319 g. Small seed tubers of the same plant gave 220 g., whilst large and small seed tubers of a small-yielding mother plant gave 113·3 g. and 80·9 g. respectively.

The author also discusses the question of degeneration in potato varieties, and considers that there is no "old age" degeneracy, but that disease control is the most important point to consider.

The quality of potatoes for table use depends upon the anatomical structure. A thick cortical layer and small number of eyes are of advantage. Variations in table quality may be inherited, and can be used for the formation of new varieties. There are also variations in quality within one strain which are produced by the particular conditions under which the potatoes have been grown.

In composition (total nitrogenous matter) there is a surprising variability within one particular variety. Smaller, younger tubers are richer in nitrogen; but particular shapes or the number of eyes do not give any information as to the nitrogen content. Specific gravity tables are unsafe for the determination of the amount of starch. One tuber with specific gravity 1·090 contained 14·32 per cent. nitrogenous matter. Another (1·091 specific gravity) had only 7·39 per cent.

There are also experimental results with regard to high protein

selection, amount of potassium chloride to the acre, and a useful bibliography of 114 numbers.—*G. F. S.-E.*

**Potato Leak (Potato Diseases).** By W. A. Orton (*U.S.A. Dep. Agr. Circ.* 23; January, 1909).—Considerable loss is occasionally experienced from the rapid decay of potatoes shortly after harvesting. This trouble is locally known by the term "leak" or "melters." The decay is due to the invasion of a fungus (*Rhizopus nigricans*). The fungus can enter only through wounds, and potatoes injured by careless digging especially are attacked. The fungus is propagated by spores produced in large heads, or sporangia. It can grow on a variety of dead organic substances. It is known to cause decay in sweet potatoes, apples, and pears. As a remedial measure avoid breaking the skin of the potato in handling; avoid piling newly dug potatoes in large piles where they will "sweat." Keep the potatoes dry and well ventilated.

*M. C. C.*

**Potato Plant Louse.** (*Nectarophora solanifolii*). By E. M. Patch (*U.S.A. Exp. Stn. Maine, Rept.* 1907, pp. 235-257; figs.).—This aphid is reported to have done great damage to potatoes during recent years. The insect attacks the upper parts of the plants and causes the shrivelling of leaves, etc. A general account of the life cycle of aphides is given and details concerning field and insectary observations. The winter host of the species is at present unknown, but in captivity the insects fed on both shepherd's purse and peas. It is regarded as impracticable to spray large areas of potatoes with paraffin emulsion or, so far, to attack the pest through its winter host, but it is thought that clean cultivation including autumn ploughing and burning old potato haulm may have a beneficial effect. Various predaceous insects were found feeding upon it and parasitic insects and fungi which destroyed the insects wholesale were discovered. Technical descriptions of the various stages of the insect are given.—*F. J. C.*

**Potato Scab.** By W. J. Morse (*U.S.A. Exp. Stn. Maine, Rept.* 1907, pp. 304-317; figs.).—The following table shows the results obtained by disinfecting tubers:

| —                   | Lb smooth | Lb. scabby | Total from plot | Per cent. scabby |
|---------------------|-----------|------------|-----------------|------------------|
| Formalin solution:  |           |            |                 |                  |
| Seed scabby . . . . | 776       | 5          | 781             | 0.6              |
| „ smooth . . . .    | 820.5     | 6.5        | 827             | 0.8              |
| Formalin gas:       |           |            |                 |                  |
| Seed scabby . . . . | 822.5     | 9.5        | 832             | 1.1              |
| „ smooth . . . .    | 834       | 3.7        | 837.7           | 0.4              |
| *Sodium benzoate:   |           |            |                 |                  |
| Seed scabby . . . . | 849.5     | 10.6       | 860.1           | 1.2              |
| „ smooth . . . .    | 855.5     | 15         | 870.5           | 1.7              |
| Untreated:          |           |            |                 |                  |
| Seed scabby . . . . | 792       | 55.1       | 847.1           | 6.5              |
| „ smooth . . . .    | 819       | 36.7       | 855.7           | 4.3              |

\* Soaked two hours in 15 gallons of water containing 20 ozs. of sodium benzoate. The treatment in the other cases is detailed in the following abstract.

Thus exposure of the seed to formaldehyde gas is as effective as steeping in formalin solution. A figure and description of the fumigating room is given. The quantity of formaldehyde gas recommended was found not to injure the eyes of the potato in any way except when the tubers were placed very near the generating pan or immediately above it. Lime was shown to increase the amount of scab materially thus :

| Treatment                        | 1000 lb. lime | 500 lb. lime | No lime |
|----------------------------------|---------------|--------------|---------|
| Per cent. of scab on potato crop | 49            | 27           | 11      |

F. J. C.

**Potato-Scab, Prevention of.** By W. J. Morse (*U.S.A. Exp. Stn. Maine, Bull.* 141; 1907). Potato scab due to the fungus *Oospora scabies* is reported to be spreading. The scab fungus thrives best in an alkaline soil, and is favoured by the application of stable manure, wood ashes, air slaked or caustic lime, potash, lime and magnesia. It is more prevalent in heavy, moist soils than in light, dry ones. When the soil is once infected the danger of the disease attacking potatoes placed in it remains for many years. It is recommended to green manure such land as a partial check upon the disease before attempting to grow potatoes upon it. When fresh soil is brought into cultivation care should be taken to plant only tubers free from scab, and these should be disinfected. The potatoes may be soaked for 2 hours in a solution of  $\frac{1}{2}$  pint of formalin in 15 gallons of water, or in a solution made by dissolving 2 oz. of corrosive sublimate in 15 gallons of water for  $1\frac{1}{2}$  hour. The seed tubers may also be disinfected by exposing them to formaldehyde gas in a close room for from 24 to 48 hours. The gas is generated by placing potassium permanganate in wide, flat-bottomed tin or galvanized basins 8 inches in height, and pouring over it formalin, closing the room at once. Twenty-three ounces of potassium permanganate and 3 pints of formalin are required to generate sufficient gas to fill 1000 cubic feet.—F. J. C.

**Potato Scab, Varieties of.** (*Jour. Bd. Agr.* xv. 10, January 1909; pp. 749-751; 2 plates).—Scab in potato may be due to (1) mechanical injury, due to the presence of ashes or sharp sand in the soil, or to a season of drought; (2) black scab due to the attacks of a fungus; (3) the attack of millipedes, especially *Julus pulchellus*; (4) the attack of the fungus *Oospora scabies*, which produces a scab superficially resembling that due to mechanical injury, but distinguished by the presence of the parasite; (5) the attack of the fungus *Spongospora scabies*.—F. J. C.

**Potato Spraying.** By W. J. Morse (*U.S.A. Exp. Stn. Maine, Rept.* 1907, pp. 287-304).—Relative results of spraying with standard Bordeaux mixture against the leaf diseases caused by *Phytophthora infestans* and *Alternaria solani*, as compared with dust sprays and spraying with Bordeaux substitute are reported, the results being greatly in favour of the Bordeaux mixture. Heavy and frequent spraying is shown to be more beneficial than frequent light spraying with Bordeaux, owing probably to the better covering of the foliage by the former method. Spraying is often ineffectual in Maine because the spray is imperfectly distributed, the commencement of spraying is delayed too long, the



mixtures are improperly made, the quantities to be used being guessed at, and the materials are mixed in the wrong way.—*F. J. C.*

**Potato : Surface Spotting of Tuber.** By W. J. Morse (*U.S.A. Exp. Stn. Maine, Rept.* 1907, pp. 321–322).—Black spots on the surface of the tuber from the size of a small pea to half-inch in diameter, on which, when isolated, the fungus *Phytophthora infestans* developed. It is recommended that such tubers be not planted.—*F. J. C.*

**Prairie Grass of Dakota, Floral Succession in the.** By Le Roy Harris Harvey (*Bot. Gaz.*, August 1908, pp. 81–109 ; with 3 figures).—The author describes three distinct stages, early spring, spring, and early summer (second week in June to end of July) in the flora of South-Eastern South Dakota.

The climatic features of each of these successive flowering periods are given very fully, and the differences due to the various exposures and to the positions of the plants (as at the base or toward the crest of the ridges) are carefully distinguished.

This area seems to show the steady colonization of part of the prairie by the forest flora of the south-eastern district, to which region, in the author's opinion, it had been driven back during the glacial period. He considers that the "*Poa pratensis* sod" is followed and occupied first by the Wolfberry shrub (*Symphoricarpus occidentalis*). This is the forerunner of *Rhus glabra*. These two shrubs are then dispossessed by *Quercus macrocarpa* and *Ulmus fulva* associations as the forest pushes out on the prairie.

To the west and south-west of the region the plain or prairie type predominates and is of a more xerophytic character, becoming more and more arid and desert-like towards the west.

The author does not think that the absence of trees on the natural prairie is due so much to forest fires, but rather to the lack of soil moisture, and to the dense sod, which make it difficult for the seeds of trees to germinate. Seedlings will also hardly resist the severity of their first winter. This paper is a very interesting one, although a few unusual technical terms are at first disheartening to non-botanical readers.

*G. F. S.-E.*

**Preservative Treatment of Loblolly Pine Cross-arms.** By W. F. Sherfesees (*U.S. Dept. Agr. Forest Service, Circ.* 151).—An account of the seasoning and grading of the timber of the Loblolly Pine, which has been found so useful for the making of cross-arms. The length of time required for air-seasoning depends largely on the character of the timber, atmospheric conditions, and the manner in which it is piled, all of which are fully described in this pamphlet. Several useful tables and illustrations of the best methods of piling cross-arms are also given.

*A. D. W.*

**Protoplasmic Streaming and Plasmolysis** (*Bot. Gaz.* July 1908, pp. 50–56).—Miss Grace M. Bushee and W. Y. V. Osterhout have short papers on these subjects in this magazine. The former measured the rate of streaming in millimetres a minute in thirty-six common greenhouse plants. She recommends especially *Gloxinia speciosa* (cell of hair from

stem, leaf blade or petiole), *Abutilon striatum* (hair from ovary surface), *Lycopersicon esculentum*, *Whitlavia grandiflora* (hairs), *Lobelia Erinus* and *Saxifraga cotyledon* (hair from leaf-edge). The second paper deals with exceptional cases of plasmolysis in which the protoplasm is not impermeable to the substances in solution.—*G. F. S.-E.*

***Prunus serotina*** (Ehrhart), ***Prunus virginiana*** (Miller). By F. B. Power and C. W. Moore (*Jour. Chem. Soc.* vol. xcv., March 1909, pp. 243-261).—An investigation into the constituents of 'wild cherry bark,' of which hitherto little has been known, notwithstanding its use for medicinal purposes. The specimen examined yielded hydrocyanic acid, benzoic acid, an aromatic essential oil present in too small quantity for immediate investigation, oleic, linolic, palmitic, and stearic acids, ipuranol (a solid dihydric alcohol also found in *Ipomoea purpurea*, nutmeg, and olive bark), methylaescaletin (a glucosidal compound allied to one found in the horse chestnut and in seeds of *Euphorbia Lathyris*) protocatechuic acid, *p*-coumaric acid, and trimethylgallic acid (a substance not hitherto found in nature).—*W. A. V.*

***Pseuderanthemum seticalyx*** (*Bot. Mag.* tab. 8244).—Nat. ord. *Acanthaceae*; tribe *Justicieae*; Tropical Africa. Under-shrub, erect; leaves ovate; inflorescence spiked; corolla salver-shaped, limb cinnabar-red, 1 inch diameter.—*G. H.*

**Psylla (Apple Sucker).** By the Duke of Bedford, K.G., and Spencer U. Pickering, F.R.S. (*Woburn, Tenth Report*, 1909, pp. 26-34).—The best results in controlling this pest were obtained by spraying with a nicotine solution between the time of the swelling of the fruit buds and the fall of the blossoms, a mortality of 90 to 99 per cent. resulting when the strength of the solution was not below .075 per cent. (*e.g.* one pound of Voss's solution in 10 gallons of water). Growers should ascertain the strength of the solution they buy.—*A. P.*

***Rehmannia angulata*.** By Max Ghierbrandt (*Le Jardin*, vol. xxii. No. 513, p. 204; July 5, 1908; 2 figs.).—The author finds this to be a much hardier plant than is generally supposed. It resists frost in an unheated greenhouse better than Pelargoniums, and may be planted out by the end of April. A month later it will be in full flower, and continues to bloom throughout the summer and autumn. Moreover, it will bear taking up and potting for exhibition at any moment, with subsequent replanting. The flower lends itself as readily as *Salpiglossis* or *Mimulus* to the production of new variations in colour. Already such varieties of the common *R. angulata* as *tigrina* and *rosea* are in the market.—*F. A. W.*

**Respiration, Rise of Temperature in.** By George T. Pierce (*Bot. Gaz.*, September 1908, pp. 193-202).—The author has found a new and efficient method of exhibiting the increased temperature in respiration and fermentation.

This consists essentially in the employment of Dewar's flasks or double-walled glass vessels with a vacuum between the two walls. (The

ordinary "Thermos" flasks depend upon the same principle.) He was able to obtain with silvered flasks temperatures of  $54^{\circ}$ ,  $55^{\circ}$  and  $56^{\circ}$  with living germinating peas, whilst the dead peas in control flasks only showed temperatures of  $14^{\circ}$  and  $15^{\circ}$ .

The rise of temperature in the case of fermenting yeast was clearly shown, and also the increase in temperature or "fevered state" of chopped onions when compared with uninjured specimens.

The efficiency of the individual Dewar's flasks appears, however, to show considerable variation.—*G. F. S.-E.*

**Ribes speciosum.** By J. Mottet (*Le Jardin*, vol. xxii. No. 518, p. 271; September 20, 1908; 1 fig.).—*Ribes speciosum* or *fuchsoides*, a native of California and British Columbia, was introduced in 1829. The small pendant flowers are characterized by very long stamens of a brilliant scarlet. The bush resembles *Fuchsia Riccartoni* closely, but its long sharp thorns distinguish it. It grows about 3 feet high, and flowers in May and June. Fruit a small red berry. In the autumn the foliage turns a rich crimson. Unfortunately, it is not hardy, and needs protection in winter. But in the south it grows to a great height, and is a striking ornament to the shrubbery.—*F. A. W.*

**Root, Geotropy of.** (*Beih. Bot. Centralbl.*, xxiv., Erste Abth., Heft 1, pp. 96–110; with 1 plate and 6 figures).—Mr. Frederick C. Newcombe shows that the sensitiveness of the root to gravity is not confined to the last 2 mm. of the root tip, but may extend 4 mm. back from it, and possibly through the elongating zone.

There is apparently no relation between the extent of the sensitive zone and length of the elongating zone.—*G. F. S.-E.*

**Roots of *Fagara xantholoxoides*.** By H. Pries (*Not. König. Bot., Berlin*, No. 44, pp. 99–101).—The rind of these roots contains fagerol ( $C_{14}H_{14}O_4$ ), and two alkaloids, which resemble myosin and veratin in physiological action.—*S. E. W.*

**Rubber Tree in Hawaii, The Ceara.** By Jared G. Smith and Q. Q. Bradford (*Hawaii Agr. Exp. St. Bull.* 16; 30 pp.).—Gives a very full account of the cultivation and tapping of this valuable rubber-producing plant. Rubber is now so valuable and much in request that enough of the raw material to satisfy the yearly demands is not forthcoming. There is now apparently a race among countries having lands available for rubber production to see which can get the largest acreage of rubber trees into bearing in the shortest time, in order to harvest the marvellous profits which seem almost absolutely certain.—*A. D. W.*

**Rubus koehneanus** (*Bot. Mag.* tab. 8246).—Nat. ord. *Rosaceae*; tribe *Rubeae*; Japan. Shrub 3–4 feet high; leaves 3–5 lobed, green above, white pubescent below; flowers few, petals white; drupes few, orange.—*G. H.*

**Salts in the Soil, Absorption of.** By J. Rosen and C. Heller (*Bot. Gaz.*, September 1908, pp. 224–229).—The authors found that wheat seedlings when only watered with potash and other salts endured far



greater concentrations of the salt than similar plants which were immersed in soil extracts.

Even so low a concentration as 700 parts in a million (of  $P_2O_5$ ) proved injurious to those immersed, but when watered with a solution of 2,000 parts in a million the plants remained alive for three weeks. These results were found with plants growing in sterile quartz sand; but in ordinary soil, and especially in manured soil, still higher concentrations were tolerated.

The absorption of phosphates in the soil varied (according to the system used for detection) from 20.5 to 27.2 parts in a million in a solution of 1,000 parts in a million, or in manured soil from 25.5 to 30.2 parts in a million. With a solution of 2,000 the absorption varied from 26 to 32.6 parts in a million. The absorption is a negligible quantity in the case of nitrate salts.—*G. F. S.-E.*

***Saxifraga scardica*** (*Bot. Mag.* tab. 8243).—Nat. ord. *Saxifragaceae*; tribe *Saxifrageae*; Balkan Peninsula. Herb, densely tufted; leaves  $\frac{1}{4}$ – $\frac{2}{3}$  inch long; stems 3–4 $\frac{1}{2}$  inches long; bearing clusters of white flowers.  
*G. H.*

***Schizophragma hydrangeoides* and *Hydrangea petiolaris***. By R. Rimbault (*Le Jardin*, vol. xxii. No. 519, p. 292; October 5, 1908; 2 figs.).—Two hardy climbers recommended for walls or trellis. The former is a native of Japan and throws out aerial roots which cling like Ivy. The deciduous leaves develop in April, and are opposite and cordiform, bright green above and white below. Flowers small and creamy-white, in dense corymbs. Large oval folioles of the purest white are superposed on the inflorescence, developing above the flowers, and form the chief attraction of the plant. Flowers May–June. Best propagated by cuttings. *Hydrangea petiolaris* differs in having no folioles, but a few flowers with large white sepals project from the inflorescence, *Hydrangea*-fashion.  
*F. A. W.*

**Scillas.** (*Garden*, January 1909, p. 17.)—The writer, continuing a previous article, finds a depth of eight inches the deepest at which the common bluebell can be planted with success. The spikes are finer, and the yield of flowers and seeds greater when the bulbs are barely covered with soil. He enumerates seven varieties of *Scilla*, and gives cultural directions for each.—*H. R. D.*

***Senecio latifolius*, Alkaloids of.** By H. E. Watt, D.Sc. (*Jour. Chem. Soc.* vol. xcv., March 1908, pp. 466–477).—A research undertaken at the request of the Cape Government, who are investigating the alleged poisoning of cattle by this plant.

Two hitherto unknown alkaloids were isolated, for which the authors propose the names Senecifoline and Senecifolidine respectively. The former of these has been found to be poisonous to animals, but further investigation is in progress.

The injurious effects of other species of *Senecio* are already known.

*W. A. V.*

**Shade, Effect of in Preventing Fruiting.** By L. Chasset (*La Pomologie Française*, March 1908, p. 85).—A 'Beurré Superfin Pear,' shaded by a small house, has taken seventeen years before bearing any fruit; a 'Joséphine de Malines' planted in the shade of a large tulip tree has never borne fruit. Two trees of the same varieties planted in the sun, pruned by the same gardener, regularly produce each year small crops of very good pears. The shade of the house and the tree has in this case evidently been the cause of sterility.

Composition of the soil also affects fertility; some soils lack phosphate of lime or potash and the trees bear after the necessary constituents have been supplied.—C. H. H.

**Shade Trees, The more important Insects affecting Ohio.** By J. S. Houser (*Agr. Exp. St. Ohio, Bull.* 194).—Contains information regarding the injurious woodland insects of Ohio, but particularly such as affect shade trees. The beautifully executed illustrations, some sixty in number, make the work still more valuable, for little difficulty will be found in recognizing a particular species from the pictures. What strikes one most in reading the book is the almost entire absence from the Ohio woods of the insect pests which trouble us so in this country. There are useful notes regarding spraying, preparing the various insecticides, and a table showing the common trees of New York State with relation to their liability to insect attack. The Ohio conditions do not vary to any great extent from those of New York.—A. D. W.

**Shrubs, A Wild Garden of.** By W. Dallimore (*Garden*, January 1909, p. 87).—The writer tackles the problem of covering dry banks of poor soil. He states that it has been satisfactorily solved at Kew by using for the purpose, double, single, and dwarf Gorse, Lavender, Rosemary, *Cistus laurifolius*, *C. ladaniferus*, *C. recognitus*, Savin, Brambles, *Potentilla fruticosa*, *Berberis aquifolia*, and *B. stenophylla*.—H. R. D.

**Shrubs and Hardy Trees suitable for Forcing.** By A. Osborn (*Gard. Chron.*, No. 1,146, p. 403, December 12, 19, and 26, 1908).—The author gives a list of the plants most suitable for forcing, and the best methods of cultivating them.—G. S. S.

**Shrubs for Winter Effect, Best Evergreen.** By Miss R. B. Cannon (*Garden*, January 1909, p. 15).—The writer mentions thirty-nine species, and gives directions for planting, pruning, and propagation.

H. R. D.

**Shrubs in Spring Bedding.** By A. W. (*Garden*, January 1909, p. 15).—The writer mentions shrubs suitable for the purpose, particularly referring to Forsythia, Ribes, Cydonia, and Dayhne, and giving directions for their treatment when used in this manner.—H. R. D.

**Shrubs, The Unseasonable Flowering of.** By S. W. Fitzherbert (*Garden*, January 1909, p. 27).—The writer mentions the following in flower at the close of 1908: *Choisya ternata*, *Cytisus racemosus*, *Pittosporum Tobira*, *Laburnum*, *Crataegus oxyacantha*, *Olearia stellata*



*Calceolaria Burbidgei*, *Leptospermum scoparium*, *Correa cardinalis*, *Grevillea rosmarinifolia*, and *Convolvulus cneorum*.—H. R. D.

**Sisyrinchium, Anatomical Studies of North American Species of.** By Theo. Holm (*Bot. Gaz.*, September 1908, pp. 179-192; 2 plates).—The author finds from the anatomical characters that the genus is a very natural one and ought not to be subdivided.

"In regard to the almost untold number of recently described 'species' of *Sisyrinchium*, I have examined the internal structure of some of these, but so far have failed to detect any character that might appear specific; and, moreover, it seems very evident, when the diagnoses of the majority of these are read, that they deal not with 'species' but merely with 'local forms.'"—G. F. S.-E.

**Snowdrops and how to grow them.** By W. Irving (*Garden*, January 1909, p. 1).—The writer recommends growing them in the grass, under the shade of trees, on the margins of woodland walks, or in thin deciduous shrubberies. After mentioning the autumn-flowering species, *Galanthus nivalis* var. *octobrensis* (October), *G. Olgae* (November), and *G. cilicius* (December), which he notices fail to increase readily, Mr. Irving enumerates fourteen varieties, giving cultural details, laying stress on the importance of a light, well-drained soil, which will allow the bulbs to become somewhat dry in summer. He also gives instructions for cultivation in pots.—H. R. D.

**Sorbus Vilmorini** (*Bot. Mag.*, tab. 8241).—Nat. ord. *Rosaceae*; tribe *Pomeae*; China. Shrub or small tree 10-20 feet high; leaves slender, unequally pinnate, with 9-14 pairs of leaflets; flowers small, white; fruit globose, red.—G. H.

**South Texan Prairie, Change of Vegetation on the.** By O. F. Cook (*U.S. Dept. Agr., Bur. Plant Industry, Circ. No. 14*).—According to Mr. O. F. Cook, forest and swamp once occupied the gulf plains of Texas. Then followed a period of primitive Indian agriculture, in which forest stretches were cleared by fire. Such clearings remained under grass on account of the regular fires, which prevented the development of trees. So the land became open grassy prairies, where nomad hunters chased the great herds of buffaloes. In the early days of cattle ranching the fires were "very besoms of destruction" but as the grazing became more thorough, the fires became of less importance and were kept under control. Sometimes it was found impossible to set fire to the old grass, especially in dry seasons.

Then a new development began, for pioneer bushes of the *Prosopis* established themselves and formed "open mesquite country"; upon these followed the invasion of *Acacia Farnesiana*, giant cacti, or "oak runners," and the forest was by means of these forerunners gradually reoccupying the land.

But this will not happen, for the ranch-owners are selling their land to "truck" farmers who find the land fertile and productive even though five to ten dollars an acre has to be paid for clearing away the bushes.



Unfortunate speculations, "booms," and individual losses will doubtless occur. Irrigation and tillage are, however, transforming not only the appearance of the country but the character of the soil itself.—*G. F. S.-E.*

**Spenser, The Flowers of.** By H. N. Ellacombe (*Gard. Chron.*, No. 1,121, p. 393, June 30, 1908, and subsequent Nos.).—In this paper Canon Ellacombe gives an alphabetical list with interesting comments upon the flowers mentioned by the poet Spenser. The writer says: "The account of the flowers does not profess to be a positive or scientific account, and the papers are rather an annotated index, or perhaps a concordance. I have quoted, but as shortly as possible, his allusion to each plant, and added short notes on those of them which seemed to require it."—*G. S. S.*

**Spraying Mixture.** By Dr. Contant (*Jour. Soc. Nat. Hort. Fr.*, p. 122; February 1909).—The author describes the process of manufacture of a spray fluid which he has found very effective, with the warning that, as it produces poisonous fumes during its preparation, it must be made out of doors. Once it is on the trees, however, a short exposure to the action of the air makes it quite innocuous to all but insect pests. A cauldron capable of holding 36 litres is raised on three bricks, 2 litres of water are put in it, and a fire is lighted underneath. When the water boils,  $1\frac{1}{2}$  kilos. of quick-lime are put into the cauldron to slake. Water is then added little by little until the kettle is half full, and next  $1\frac{1}{2}$  kilos. of flowers of sulphur are sifted in through a sieve, the mixture being stirred all the while to prevent its getting lumpy. When the sulphur is well mixed the whole is left to boil for about half an hour, and finally enough water is added to fill the cauldron.

If there are many tree to dress, the mixture may be well stirred up and applied with a brush to trunk and branches during the winter, not later than the end of January, as it would burn the buds later.

The mixture may also be left standing for six hours, when a yellow deposit, having a slight excess of lime, will have settled at the bottom, leaving a clear orange-coloured liquid above. This may be drawn off with a syringe into some vessel which may be corked up, as it spoils if exposed to the air.

What Dr. Contant calls the "pure mixture" or the deposit should be applied in the same way as already described, first scraping the lumps made by scale, to allow the poison to have its full effect. The clear liquor, on the other hand, may be used for spraying during spring and summer. When the leaves are young one part of liquor to ten parts of water is strong enough, later one in six parts may be used. For peaches, vines, roses, and beans, however, the weaker solution is always safer.

For slugs among strawberries or salads, make holes from 15 to 20 centimetres deep among the plants, pour in a glassful of the mixture, and fill in the hole.—*M. L. H.*

**Statice arborescens.** By H. Correvoon (*Le Jardin*, vol. xxii. No. 514, p. 212; July 20, 1908; 2 figs.).—This curious type is indigenous to the Canaries, as already described by M. Correvoon in *La Nature*, April 7, 1906. The *Gardeners' Chronicle*, December 17, 1904, also has

a note by D. Perez, describing the few specimens extant—all the rest having died out or been devoured by wild goats. These plants rarely produce seeds, owing probably to senility of species, but a few have been collected and raised at Lyons, whence comes this new and charming sub-arborescent species. Height 3–4 feet, with graceful panicles of blue flowers—almost perpetually in bloom. The best species are *S. arborescens* Brouss, and *S. fruticans* Webb. *S. brassicaefolia* Webb, *imbricata* Webb, *macrophylla* Brouss, *macroptera* Webb, and *pulverula* Webb are of a dwarfer habit, with large sprays of flowers; but all are highly ornamental. M. J. Brun, of Montplaisir, Lyons, is the principal cultivator.—*F. A. W.*

**Stock on Scion, Influence of.** By G. Rivière and G. Bailhache (*Jour. Soc. Nat. Hort. Fr.*, p. 133, February 1908).—Another note on the marked influence of the stock on the scion, taken this time from investigations made on vines.—*M. L. H.*

**Stocks, Deep Planting of Paradise.** By the Duke of Bedford, K.G., and Spencer U. Pickering, F.R.S. (*Woburn, Ninth Report*, 1908, pp. 57–64). Stocks planted 24 inches deep weighed three times as much at the end of two years as similar stocks planted only 6 inches deep, new root systems in the former case having been formed from the stems at the optimum depth below the surface. Further investigations are being conducted. With crab stocks deep planting gave bad results, as indeed it would do with all worked trees.—*A. P.*

**Stocks, Fruit Tree.** By C. T. Cole (*Jour. Dep. Agr. Vict.* August 1908).—*Apples*, in order to resist attack by woolly aphis (*Schizoneura lanigera*) are being grafted on ‘Northern Spy’ and ‘Winter Majetin,’ both stocks being immune to this pest; the ‘Northern Spy’ is the better stock. There are other blight-proof kinds of apples which could doubtless be used as stocks, but there is no need to increase the number except for special purposes. To prevent the stock from becoming weaker in its constitution from constantly working and re-working on the same variety, Mr. Cole has worked ‘Majetin’ on ‘Spy’ and ‘Maggs Seedling’ (another blight-proof kind, and robust in constitution) upon the ‘Spy,’ with the best results. For dwarf-apple culture the ‘Spy’ can be used, and the ‘French Paradise’ worked upon the ‘Spy,’ and the desired kind again worked upon the ‘French Paradise.’ There is now in this State, raised from seed there, a ‘Paradise’ apple tree of dwarfing habit, free surface rooting properties, very easily propagated, and upon which the desired kinds may be worked direct. All kinds appear to thrive admirably upon it and it is quite blight-proof. Planters need to take care that their trees are worked sufficiently above the surface of the ground to prevent the scion from striking roots into the ground, and displacing the blight-proof stock, thus rendering the whole tree roots liable to become a blighted mass.

*Apricot*.—The ‘Mussel’ plum stock is found best; ‘La France,’ a variety of the Myrobalan, is largely used, as it is easily propagated from cuttings and does not sucker.



*Peach*.—Stock raised from peach stones is generally the best; selecting stones from medium sized mid-season varieties. In some districts almond makes the best stock.

*Plum*.—The 'Mussel' plum stock is generally best; other varieties used include the 'Julien,' the seedling plum stock, also 'La France' a variety of the Myrobalan cherry plum, upon which Diamond and Orleans plums succeed well.

*Cherry*.—The 'Mazard' and 'Mahaleb' stocks used in Europe do not suit Victoria. There, a small red cherry of the 'Montmorency' section, much like a 'Kentish,' is found to be the best suited: it is a good cooking variety, and pleasant to eat; it acts as a dwarfing stock.

*Pear*.—The stock most generally adapted for the pear is the seedling pear stock, raised from the hardiest known kinds. Pear suckers are a bad stock.

A small variety of quince, 'Angers,' is successful. As there are but very few kinds of pears that do well when worked directly upon this quince, it is usually necessary to double work, using first such kinds as 'Beurré d'Amanlis,' 'Louise Bonne of Jersey' or 'Beurré Diel' upon the quince; allowing them to make one growth, and then working upon these the desired sort, when perfect health and vigour will be attained.

C. H. H.

*Stokesia cyanea praecox*. By G. T. Grignan (*Rev. Hort.*, February 16, 1909, pp. 83-85; coloured plate and illustration).—A very pretty large Aster-like flower,  $3\frac{1}{2}$  inches across, lilac-tinted, with conspicuous white stamens, hardy, somewhat dwarfer than type, does best with southern exposure.—C. T. D.

*Stomata*. By Sophia H. Eckerson (*Bot. Gaz.*, xli., September 1908, pp. 221-224).—According to the author the stomata of well-watered greenhouse plants are widely open about 10 A.M. and in favourable weather remain so until about 2.30 P.M., when they begin to close. They are fully closed by 5 P.M. or 6 P.M. On hot days in the spring they may shut even at 12 noon because of incipient wilting of the leaf.

The author recommends *Chrysanthemum*, *Tradescantia*, and *Pelargonium zonale* as the best common greenhouse plants for observing the stomata. A list is given of the number of stomata to the square millimetre and of length and breadth in microns in the cases of thirty-seven greenhouse plants.—G. F. S.-E.

**Strawberry and Raspberry distributed for trial from Experiment Station.** By V. P. Hedrich and O. M. Taylor (*U.S.A. Exp. Stn. New York, Bull.* 298).—As the result of ten years' work in breeding new varieties, three new kinds of strawberry and four varieties of raspberry are recommended for trial. The conditions are that the plants, six of raspberry, twelve of strawberry, of each variety, are given free, carriage being paid by the grower, he to keep the varieties true to name, give them good care, and report on the behaviour of the varieties from time to time until the value of a variety for a locality is determined. The parentage and careful description of each variety is given, with photographs of the fruits.—C. H. H.



**Strawberry Test Plot and Strawberrries.** The Newer Varieties. By F. H. Ballow (*U.S.A. Exp. Stn. Ohio, Bulls.* 178 and 186, 1906 and 1907).—The bulletins contain careful descriptions and photographs of new varieties, together with a record of flowers (perfect or imperfect), date of first blossom, first ripe fruit, period of heaviest fruiting, largest single picking in quarts, last picking, total yield in quarts for season, of some 120 sorts of strawberry.—*C. H. H.*

**Strawberries, Three New.** By M. Houssy (*Le Jardin*, vol. xxii. No. 520, p. 317: October 5, 1908; 1 fig.).

1. *Gemma*, out of 'Louis Gauthier'  $\times$  'Saint Joseph.' Remarkably vigorous, and constant fruiter. Large berries, white, shading pink—oval in shape.

2. *Mirabilis*.—Same origin as *Gemma*, but distinct variety. Equally vigorous, but of more compact habit. Very precocious, free bearer. Admirable for forcing. Berries are finer than *Gemma*, pale pink shading red. Perhaps more abundant in the first year, but *Gemma* fruits better in its second season.

3. *Suavis*, from 'Sharpless'  $\times$  'Saint Joseph.' Distinguished for size and flavour rather than for quantity of berries. Deep red. Rather susceptible to drought.—*F. A. W.*

**Sumac, Commercial Sicilian.** By F. P. Veitch (*U.S. Dept. Agr. Bur. Chem. Bull.* 117).—As a vegetable tanning material Sicilian Sumac has perhaps no equal for pale colours and soft tannage, and consequently is extensively used for moroccos, roans, skivers, &c., and for brightening the colour of leather tanned with dark materials.

The Sicilian Sumac (*Rhus corioria*) is a small shrubby bush, native of Sicily and Tuscany, and succeeding best on soil of a calcareous nature. The leaves from which the tannin matter is extracted are collected about the beginning of July and left lying on the field till partially cured, care being taken that they are not unduly exposed to rain or intense sunshine. There is much valuable information given as to the means by which adulteration of the Sumac is detected, and lengthy tables as to the chemical and microscopical examination of the samples that were furnished.—*A. D. W.*

**Thermotropism of Flaxplant.** (*Beih. Bot. Centralbl.*, xxiv., Erste Abth., Heft 1, pp. 111-131; with 6 figures).—The flax is very sensitive to heat, and shows very interesting curves and bendings which are fully investigated by Herr Josef Pohl in this paper.—*G. F. S.-E.*

**Timber Trees in the Cameroons.** By A. Engler (*Not. König. Bot. Berlin*, Appendix xxi., No. 1, pp. 1-8; 4 plates).—The following trees (order Olacaceae) are prized by the natives on account of the hardness of their wood:—*Ongkea Camerunensis*, *Strombosia grandiflora*, *S. Scheffleri*, *S. glaucescens*, *Strombiopsis tetrandra* and *Coula edulis*. The seeds of the last are eaten raw or roasted.—*S. E. W.*

**Tree Planting** (*The Quarterly Journal of Forestry*, January 1909).—"Recent Progress in Afforestation" contains much that is practical and to the point, while "Tree planting in Towns," though not going fully

into the matter, is valuable as partially elucidating a question that to Londoners at least is of more than passing interest.

Another excellent paper is that on effects of overthinning and ground moisture upon the growth and value of plantations, in which the prevailing tendency to leave the standards too far apart on the ground is clearly put forward.—A. D. W.

**Tree and Wood-infesting insects, Some.** By H. Garman (U.S.A. *Exp. Stn. Kentucky, Bull.* 120; May 1905; 3 plates and figs.).—An account of the principal insect pests of trees and wood in Kentucky. The elm leaf-beetle (*Galerucella luteola*) is a serious pest of the English elm. Banding to catch the mature insect is absolutely useless, but a band placed round the trunk when the larvae are about to descend the tree to pupate in the earth will entice many to form pupae behind it, where they may then be captured and destroyed. Spraying with arsenate of lead has proved very effective. 13096 beetles (larvae, pupae and imago) were obtained from one tree. Other insects dealt with are a leaf-miner (*Lithocolletis hamadryadella*) causing considerable damage to the bur oak and Chinquapin oak; an ally of the scale insects, *Kermes pubescens*, destructive to the same trees, to be kept under control only by spraying; the walnut worm (*Dartana integerrima*); the cottonwood leaf-beetle (*Lina scripta*); the poplar leaf-tier (*Melalopha inclusa*); the vagabond gall-louse (*Pemphigus vagabundus*) forming flat, lobed projecting galls on willows; the willow leaf-beetle (*Lina lapponica*); the willow flea-beetle (*Crepidodera helvina*); the herald (*Scoliopteryx libatrix*), the larvae of which feed on willow, &c., one of the few moths which are indigenous both in North America and in Europe; the willow slug (*Pteronius ventralis*), &c.—F. J. C.

**Trees of Togoland.** By G. Volkens (*Not. König. Bot. Berlin, Appendix xxii.*, No 1, pp. 1–82; 10 plates).—This list contains the names of many trees which are useful only as fuel. Among the most valuable on account of their hardness are *Chlorophora excelsa*, *Antiasis africana*, *Ficus umbrosa*, *Faurea speciosa*, *Ximenia americana*, *Xylopia Eminii*, *Parinarium curatellaefolium*, *P. subcordatum*, *Albizzia fastigiata*, *Acacia arabica*, *A. Suma*, *Prosopis oblonga*, *Piptadenia Kerstingii*, *Parkia africana*, *Erythroplocum guineense*, *Detarium microcarpum*, *Afzelia africana*, *Dialium guineense*, *Distemonanthus Benthamianus*, *Cassia Sieberiana*, *Cordyla africana*, *Ormosia laxiflora*, *Baphia nitida*, or Camwood, *Pterocarpus erinaceus*, *Erythrina senegalensis*, *Balanites aegyptica*, *Limonia Warneckei*, *Khaya senegalensis*, *Pseudocedrela Kotschyi*, *Carapa procera*, *Melia Azedarach*, *Ekebergia senegalensis*, *Trichilia emetica*, *Mangifera indica*, *Anacardium occidentale*, *Spondias lutea*, *Ericodum Kerstingii*, *Talsiopsis oliviformis*, *Zizyphus Jujuba*, *Thespesia populnea*, *Cola cordifolia*, *Ochna Afzelii*, *Pontadesma Kerstingii*, *Rhizophora Mangle*, *Terminalia dictyoneura*, *Anogeisus leiocarpa*, *Syzygium guineense*, *Peucedanum araliaceum*, *Butyrospermum Parkii*, and *Malacantha Warneckiana*.—S. E. W.

**Tropical Fruits in Covent Garden.** By H. F. Macmillan (*Gard. Chron.*, No. 1,148, p. 443, figs. 177–181, and supplement, December 26,



1908).—A short account is given of each of the various kinds of tropical fruits which have recently been for sale in Covent Garden Market; the author says "it may be of interest to give a few particulars concerning these, as well as descriptive notes from my own experience in the tropics." The paper is a decidedly interesting one.—*G. S. S.*

**Tunica Saxifraga, Double.** By G. T. Grignan (*Rev. Hort.*, December 1, 1908, pp. 543, 544; one illustration).—The illustration represents a very pretty and floriferous specimen of this Saxifrage, evidently well fitted for rockeries or pot culture.—*C. T. D.*

**Tyloses.** By Hermann von Alten (*Bot. Zeit.* 67th Jah, Aug. 29, 1909, Heft 1, pp. 1–23, with 4 figures and 1 plate).—A very useful summary and discussion of what is known with regard to tyloses. An unknown writer in 1845 correctly explained them as protuberances of the surrounding parenchyma cells into the cavities of the vessels. They may be the result of reduced tissue tension in the vessels owing to a wound, or to an abnormally low gas pressure caused in old wood by the cessation of water conduction. They sometimes close up or seal the vascular tissue, preventing loss of water, but in the case of climbing plants they may assist in the ascent of sap by diminishing the width of the vessels. Sometimes they act as 'pumps' pressing out carbonic acid into the sap and extracting from it nutritive salts. There is also a useful bibliography.—*G. H. S.-E.*

**Weight, Measurements of, Increase in.** (*Beih. Bot. Centralbl.*, xxiv., Erste Abth., Heft 1, pp. 45 *et seq.*; with four figures).—Dr. Hugo Hackenberg gives a series of tables dealing with the rate of increase in dry weight of *Cannabis sativa* and *C. gigantea*. The "substance quotient" is obtained as follows: Specimens are taken at fixed intervals; the average dry weight at each period is then divided by that found at the preceding time of measurement.

The seedlings one week old were 3·3 to 6·7 per cent. lighter in dry weight than the same number of seeds before planting.

After this period there is an increase in dry weight, and the substance quotient varies from 1·9 to 2·5. After the difference in sex is perceptible, the male plants increase more slowly than the females. In some of the male plants the weight was actually less after flowering (due to loss of leaves and pollen).

The quotient curves seem to be independent of normal climatic fluctuations. The plants assimilated with the same regularity in spite of unfavourable conditions. But when a series of both male and female plants were grown in shade the quotients were distinctly lower in the shaded plants, and the dry weight was very much smaller than in the control sun-plants.

The male plants were more injuriously affected by shade than the female ones.—*G. F. S.-E.*

**Woburn, Ninth Report, 1908.** By the Duke of Bedford, K.G., and Spencer U. Pickering, F.R.S.—This Report deals mainly with experiments in unorthodox methods of planting, and these have been

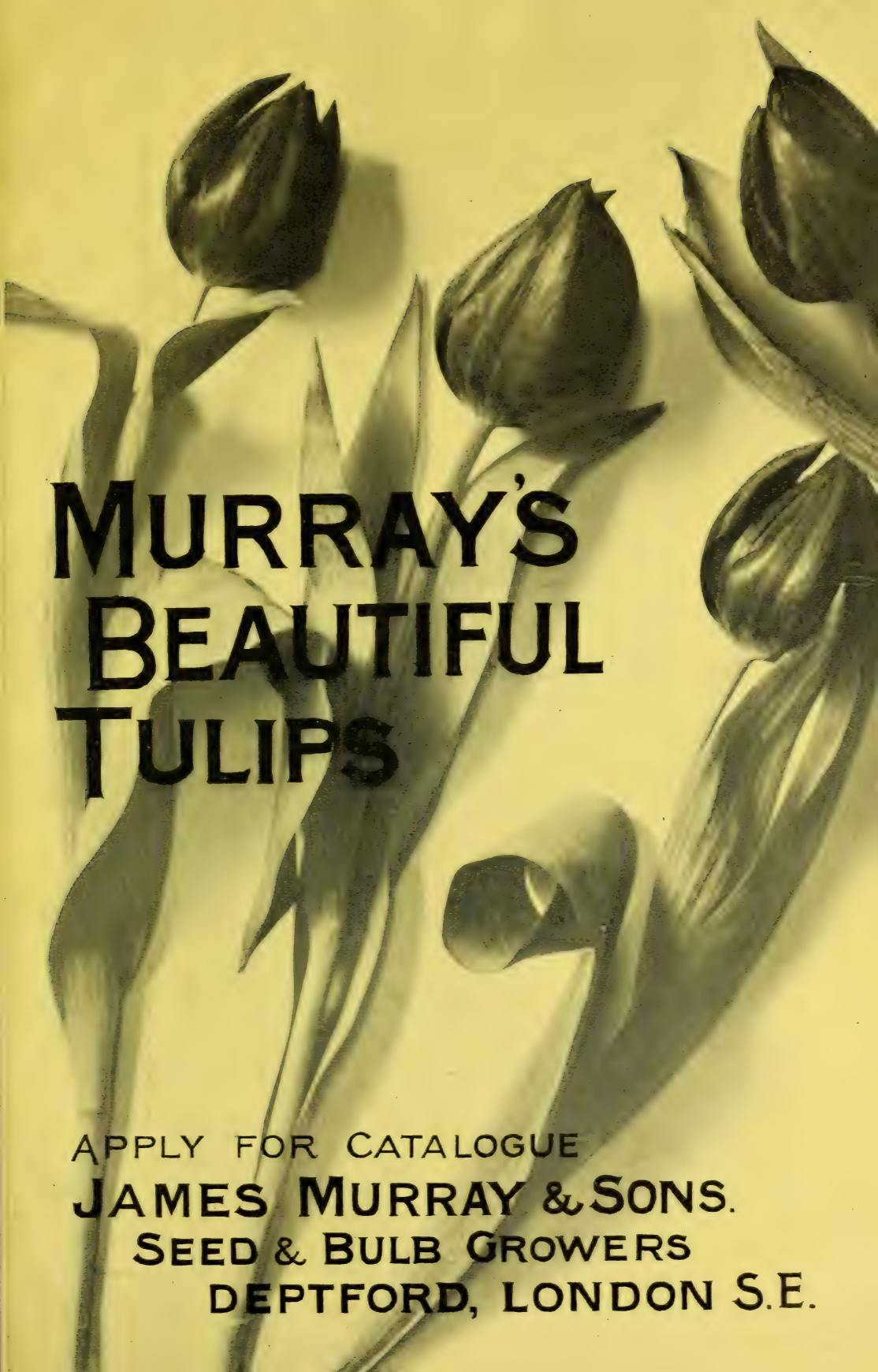


conducted on a larger scale than would otherwise have been the case owing to the attention, not altogether favourable, attracted by the portions of the Fifth Report which dealt with the same subject. The fact that the trials have been made with over 2,000 trees, planted by ten persons in seventeen localities, compels us to give the conclusions arrived at our earnest attention, however much they may be at variance with our preconceived notions and the accepted ideas of good practice. See notes under "Fruit Trees" and "Paradise Stocks."—*A. P.*

**Woburn, Tenth Report, 1909.** By the Duke of Bedford, K.G., and Spencer U. Pickering, F.R.S.—This Report is founded on observations made during 1908 on the treatment of trees for insect pests. See notes under "Insecticides," "Psylla," "Paraffin," and "Woolly Aphis." *A. P.*

**Woolly Aphis on Nursery Stock and Young Trees.** By the Duke of Bedford, K.G., and Spencer U. Pickering, F.R.S. (*Woburn, Tenth Report, 1909*, pp. 2-12).—Fumigation with hydrocyanic acid being dangerous alike to the operator and the trees, and not always fatal to the aphids, two simple and effective substitutes have been found for it—the bodily immersion of the trees in petrol (not ordinary lighting oil) for five minutes, or in water at 115° F. for ten minutes, the latter method being recommended as it entails less risk to the trees, the mortality among them being only 5 per cent. as against 10 per cent. after the petrol treatment. *A. P.*

**Yew, Distribution of, in Germany.** By F. Kollmann (*Nat. Zeit. Land-Forst.*, Vol. 7, pp. 217-247, 6 figures, April 1909).—Notes on the occurrence of yew in various parts of Germany as a wild plant.—*W. G. S.*



# MURRAY'S BEAUTIFUL TULIPS

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# EXTRACTS FROM THE PROCEEDINGS

## OF THE

### ROYAL HORTICULTURAL SOCIETY.

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#### GENERAL MEETING.

JANUARY 12, 1909.

Mr. GEORGE BUNYARD, V.M.H., in the Chair.

*Fellows elected* (41).—Mrs. T. Aitken, Miss L. C. Alexander, Miss Antrobus, Mrs. Ashburner, Dr. A. G. Bagshawe, F.L.S., Miss A. L. Baldwin, K. L. Bilbrough, S. Boorman, J. A. Bramley, James Brown, Mrs. Buchan, Mrs. Burns, Mrs. F. Bushe, T. A. Coghlan, W. A. Conway, Miss G. Crewdson, E. E. Curtis, Miss C. I. T. Dalkin, Miss L. Deacon, Mrs. E. C. Eley, Mrs. H. M. M. Foster, G. H. Freeman, Miss E. Gask, J. E. Geoghegan, J. M. Hall, H. J. Harris, C. G. Hayman, A. D. Home-wood, Miss I. Horn, Mrs. Campbell Hyslop, Miss L. Knowles, Mrs. K. M. Maginniss, Arnold Morley, Miss L. A. Myers, Miss E. O. Paget, J. A. Pearson, J. A. Pegg, Mrs. T. Phillips Pugh, G. Riley, H. L. Robson, W. Walters, J.P.

*Fellows resident abroad* (2).—G. Johnson (Queensland), M. Mertens (Belgium).

A lecture was given on "French Gardening" by Mr. C. D. Mackay (see p. 5).

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#### GENERAL MEETING.

JANUARY 26, 1909.

Mr. E. A. BOWLES, M.A., F.L.S., in the Chair.

*Fellows elected* (65).—J. L. Anstruther, Mrs. Armstrong, Miss F. Barclay-Watson, Miss A. M. Bell, Mrs. T. R. Blurton, Mrs. L. Bonn, F. W. Bowler, C. J. P. Breach, Mrs. R. O. Burnett, Miss M. Calderon, J. A. Christie, T. B. Cope, Miss M. Corbett, Sir James L. Cotter, Bart., Mrs. Thesiger Daniell, C. F. Edwards, C. E. Elers, Miss Gertrude E. Elkington, Mrs. D. H. Evans, Mrs. T. Storar Field, Mrs. John S. Gladstone, Mrs. Gorton, C. Greenway, N. W. Grieve, Mrs. Wollaston Groome, Mrs. L. Gwyther, Lady Hampson, H. P. Harris, A. W. Hart, Mrs. Hilson, J. Wilson Hodges, Miss Hull, W. Inglis-Jones, Mrs. John Ismay, Miss Jeffray, A. C. Jonas, H. G. Jones, Mrs. Devill-Davies, G. H. Laurence, L. Lloyd-Goring, I. McDougall, Mrs. F. Makepeace, Mrs. Blackett Ord,

H. Peacock, D. Pearson, Mrs. E. Pease, C. J. Peer, H. V. Phillipps, H. Radley, C. D. Richardson, Thomas Rochford, Mrs. H. K. Rutherford, Miss F. C. Sewell, A. J. Shorthouse, C. Castle Sloane, C. Gordon Sloane, Mrs. H. J. Sparks, Miss Maxwell Stuart, S. R. Thomas, W. Thomas, Major A. R. Trotter, Miss C. Trower, Sir Augustus F. Webster, Bart., Mrs. W. W. Wiggins, T. Zarifi.

*Fellows resident abroad* (2).—Dr. Isbister (Sydney), H. K. Shaw (Calcutta).

*Societies affiliated* (4).—Cirencester Horticultural Society, Hildenborough Gardening Association, St. Albans County Club, Wadsley Horticultural Society.

A lecture was given on "A Method of using Domestic Sewage in Horticulture" by Mr. W. D. Scott-Moncrieff (see vol. xxxiv. p. 462).

## ANNUAL GENERAL MEETING.

FEBRUARY 9, 1909.

Sir Trevor Lawrence, Bart., K.C.V.O., V.M.H. (President of the Society), in the Chair.

The minutes of the last Annual General Meeting, held on February 11, 1908, were read and signed.

*Fellows elected* (68).—T. R. Ablett, Lord Osborne Beauchlerk, Miss Burton, Mrs. Herbert Bury, Lady Arthur Butler, Mrs. Richard Cecil, Col. F. W. Chatterton, H. W. Coulson, Miss M. E. Dawson, Lord de Manley, Rev. Ralph W. Doyle, Mrs. Alfred Emmott, Mrs. H. Faudel-Phillips, Mrs. Alan Fullerton, Mrs. James Gibbon, Howard Goodmaw, F. C. Greville-Smith, Mrs. Somerville Grieve, C. Hales, W. Brabazon Hallows, Viscount Hampden Dow, Countess of Hardwicke, Mrs. Harmsworth, A. F. W. Hayward, H. Frankland Hepburn, Lady Hothfield, Mrs. R. Rigby Kewley, Hon. Edith Cunlyfe Lister, Mrs. Leopold McKenna, Capt. J. H. Mander, W. J. Morgan, A. H. Norway, Miss H. G. Nussey, Lady Paget, Piercey Parker, Mrs. W. F. Paul, Rev. S. H. Phillimore, Mrs. Maurice Pope, J. M. Randall, Mrs. Richards, Mrs. Robert Rintoul, Mrs. E. Robertson, Miss Rowney, W. Rowson, John Russell, Henry K. Rutherford, W. E. Sands, F. Pilkington Sargeant, Mrs. F. Schooling, J. Steevens, Mrs. Stern, Lady Vezey Strong, W. Swire, E. E. Thayer, Mrs. Tower, Mrs. Beachcroft Towse, Joseph Turner, T. B. Tutt, Rev. A. Roland Upcher, Mrs. Philip Walker, Miss Warrender, C. Watney, Major G. Watson, R. Wells, Mrs. E. Wightwick, Mrs. J. F. Wilkin, Harold Wilkins, Tansley Witt.

*Fellow resident abroad* (1).—R. T. Turnbull (Wellington, N. Z.).

*Associates* (10).—Miss L. M. Alderson, Miss L. B. Evetts, Miss J. M. Grover, Harry Hargreaves, Miss E. M. Hinkson, Miss N. Kirby, Miss D. Loregrove, Miss C. S. McLean, Miss K. Steel, Miss M. Swynnerton.

*Societies affiliated* (3).—Abingdon Horticultural Society, Longfords Valley Horticultural Society, Morden Cottage Garden Society.

The President moved the adoption of the Report, which will be found below. This was seconded by Mr. J. Gurney Fowler and carried unanimously.

The President read the following names of the proposed new Members of Council, Vice-Presidents and Officers. These having been duly proposed and seconded, and the list circulated in accordance with bye-law 74, and no alternative names having been proposed, were declared by the President to be duly elected, viz.—

*As new Members of Council.*—Sir Trevor Lawrence, Bart., K.C.V.O., V.M.H., Sir Daniel Morris, K.C.M.G., V.M.H., Mr. Geo. Bunyard, V.M.H.

*As Vice-Presidents.*—The Right Hon. Joseph Chamberlain, the Right Hon. the Earl of Ducie, the Right Hon. Lord Rothschild, Leopold de Rothschild, Esq., C.V.O., Baron Sir Henry Schröder, Bart., V.M.H., Sir John T. Dillwyn-Llewelyn, Bart., V.M.H.

*As Officers.*—Sir Trevor Lawrence, Bart., K.C.V.O., V.M.H. (President), J. Gurney Fowler, Esq., J.P. (Treasurer), Rev. W. Wilks, M.A. (Secretary), A. C. Harper, Esq. (Auditor).

Mr. W. Marshall, V.M.H., and the Rev. W. Wilks, M.A., were each presented with the Veitch Memorial Medal.

The Victoria Medal of Honour in Horticulture was presented to Sir Jeremiah Colman, Bart., and Mr. Charles Ross.

Mr. E. M. Holmes, F.L.S., proposed a vote of thanks to the Chairman, which was seconded by Mr. W. Marshall, V.M.H., and carried with acclamation.

## REPORT OF THE COUNCIL

FOR THE YEAR 1908.

**The One Hundred and Fifth Year.**—The past year, though unmarked by any very important Horticultural events, has been a year of quiet, steady progress for our Society.

**Wisley Gardens.**—The Wisley Gardens continue to increase in favour with the Fellows of the Society. All branches of work are showing good results, and improvements are being made as time and opportunity allow. The new laboratory is proving of great assistance to the Educational work of the Society, and the result of the first year's work by the students is highly satisfactory, and well repays the Council, the Laboratory Director, the Superintendent of the Gardens, and the other Officers, for the time and labour they have devoted to it. The following report has been received from His Majesty's Inspector :—

Board of Education, Whitehall, London, S.W. :

September 10, 1908.

### *Wisley School of Horticulture.*

REV. SIR,—I am directed to transmit the following Report of H.M. Inspector for the year 1907–8 on the above-named school :—

“Provision is made for the training annually at this school of about thirty young men as scientific gardeners, and a diploma of the Royal Horticultural Society is awarded to the successful students at the end of the period of training.



"The course of instruction is designed to cover two years, but as yet only the first year course is in full operation. The course is extremely well planned and is carried out by an efficient staff of instructors.

"The Gardens of the Royal Horticultural Society are extensive and contain a very large variety of plants, both in the open and under glass. There is also a very well fitted laboratory, with good equipment for instruction in the sciences bearing on practical horticulture. The laboratory is under the charge of a well qualified and skilled instructor and the students receive a very thorough training in the scientific side of their craft. This instruction has, at present, to be made very fundamental and in some respects very elementary, as few of those admitted to the course of instruction have received a satisfactory training previously in the rudiments of science. When the second year's course is in full operation it will be possible to do some fairly advanced work.

"Originality and thought on the part of the students are encouraged by weekly discussions in the evening, when selected students read papers, which are criticized by the other students, and additional experience is gained by the students in acting on small committees in connection with the arrangements for the Society's shows in London.

"On the practical side students appear to have an unique opportunity of acquiring a knowledge of the cultivation of all the plants that they are likely to meet with in the course of their employment, and those who qualify for the diploma should have no difficulty in securing remunerative posts.

"The Royal Horticultural Society is to be congratulated on the step it has taken to encourage the educational side of the craft."

I am, Rev. Sir,

Your obedient servant,

F. G. OGILVIE.

Rev. W. Wilks, M.A.

It was also very gratifying to the Council to find that in the General Examination in Horticulture open to the whole of Great Britain, the Scholarship of £25 a year for two years offered by the Worshipful Company of Gardeners, was won by Mr. Perry, one of the students at Wisley.

In the local Examination confined to the Students at Wisley, Mr. H. E. Seaton took the first place, and has been appointed Assistant Demonstrator in the Laboratory.

Experiments have been set on foot to illustrate (1) the effect of various methods of planting fruit trees, (2) the influence of pruning and not pruning in the first winter after planting, (3) of summer pruning, (4) the importance of planting trees at a correct depth, and (5) the effect of grass over the roots of fruit trees.

**Grape Exhibit.**—At the fortnightly Meeting on September 29, an exceedingly fine collection of Grapes grown in the Vineries at Wisley, and comprising 30 varieties, was shown. The Grapes were magnificent, and, at the Council Meeting, Mr. S. T. Wright, the Superintendent of the Garden, and Mr. A. C. Smith, the Assistant Superintendent, were complimented by the President on the excellent results they had obtained.

**Contributions of Plants.**—Contributions of Orchids have been presented to the Gardens by Sir Trevor Lawrence, Bart., K.C.V.O., V.M.H., Sir Jeremiah Colman, Bart., V.M.H., Colonel Holford, C.I.E., C.V.O., W. A. Bilney, Esq., J.P., P. Ralli, Esq., F. Wellesley, Esq., J.P., J. S. Moss, Esq., C. A. White, Esq., J. Sparkes, Esq., Messrs. James Veitch, Messrs. Charlesworth, Messrs. J. W. Moore, Messrs. George Bunyard and Messrs. Sander. It is hoped that these will form the nucleus of a far larger collection in a few years to come.

**Visitors.**—The number of visitors to the Gardens, admitted by Fellows' tickets during the year 1908, amounted to nearly 11,000 as compared with 8,818 in 1907. This is exclusive of horticultural parties which were admitted by special arrangement, and would increase the total to more than 11,500.

**Wisley Trials.**—In order to protect the members of the various standing Committees from the possibility of reproach, and to secure absolute freedom from bias, the Council have arranged that in future, when trials are being made at the Gardens, the growing plants, flowers, or fruits, shall be inspected by a Sub-Committee composed of five members of the Committee interested, and that everything so grown for trial shall be kept under a number only, and that the names, both of the varieties and of their senders shall not be disclosed until a decision has been arrived at, and samples are submitted to the whole Committee at Vincent Square, together with the Report and Recommendations of the Sub-Committee. Thus, the judgments of all Sub-Committees at Wisley will be given under number only. Specimens of the produce for which a Sub-Committee shall have recommended any award, will be brought to Vincent Square at the next ensuing Meeting, and the whole Committee will then have an opportunity of considering the Report and Recommendations made by the Sub-Committee at Wisley. The Committee having inspected the samples brought up, and adopted (or otherwise) the Recommendations of their Sub-Committee, will send them up to the Council for its approval in the usual way.

**Wisley Tithe.**—In 1907 the land tax at Wisley was redeemed; this year the Tithe rent charge has been similarly treated, so that the land is now free from both these outgoings.

**A Visit to Windsor.**—On June 10, by the gracious permission of His Majesty the King, the Council and Committees visited Windsor and the Royal Gardens at Frogmore. As guests of His Worship, the Mayor of Windsor (G. Bampfylde, Esq.), an excellent luncheon was enjoyed in the Guildhall, and after visiting St. George's Chapel, the Albert Memorial Chapel, and the State Apartments, an inspection of the Royal Gardens at Frogmore followed. The Council were much impressed by the admirable cultivation and order displayed in all departments of the garden, and desire to express their great thanks to Sir Dighton Probyn, V.C., G.C.B., and to Mr. Mackellar, His Majesty's Head Gardener, for the kind way they received the visitors.

**Deputations.**—In response to invitations received, Deputations from the Society attended the Flower Shows of Truro, York, and Newcastle, and were in each City most cordially and hospitably received by the gentlemen responsible for the arrangements. The Council have, with much pleasure, accepted invitations to send Deputations in 1909 to Birmingham and to Cardiff, and negotiations are in progress relating to another important Horticultural Meeting.

**Deputation from the French Horticultural Society.**—On June 23, one hundred Members of the Société Nationale d'Horticulture de France, with their President, Monsieur Viger, and their Secretary, Monsieur Chatenay, were received by the President and Council, and after visiting the day's Flower Show they were entertained at a luncheon in the Lecture-room.

**Shows in 1908.**—During this year 34 Exhibitions, covering 41 days, have been held by the Society.

**Temple Show.**—The 1908 Spring Show in the Inner Temple Gardens, now held there for 21 consecutive years, was again a great success, and the thanks of the Society are due to the Benchers. The Private View, from 7 to 12 on the second day, arranged for the exclusive benefit of Fellows, was much appreciated, judging by the number of Fellows who availed themselves of the privilege. The Benchers have again kindly consented to the 1909 Show being held in their Gardens.

**The Summer Show.**—By the very kind permission of Mary, Countess of Ilchester, the Society's Summer Show will be again held at Holland House in 1909. The 1908 Show was even more magnificent than in preceding years, but the second day was unfortunately wet.

**Colonial Fruit Shows.**—Shows of Colonial Fruit have been held in March, June, and November.

The November Show was a great success, the applications for space far exceeding all that was available. The Rt. Hon. Lord Strathcona and Mount Royal, G.C.M.G. (who, in the unavoidable absence of the President, was received at the entrance by The Rt. Hon. Lord Balfour of Burleigh, Sir Albert Rollit and other Members of the Council), performed the Opening Ceremony, when a Hall filled with magnificent fruit—Apples and Pears from British Columbia, Nova Scotia, and Ontario; Citrus and rare tropical fruits from the West Indies; and fruits and preserves from other Colonies—was displayed before the Fellows and the public. Lord Strathcona testified to the value of the work which the Society is doing for the Colonies, and at the private Luncheon given to the Agents-General, and presided over by Sir Albert Rollit, many were the marks of appreciation as to the value of these Shows to the Colonies, and their stimulating influence on the great fruit-growing resources of our Daughter States.

**Spring Bulb Show.**—In the coming year March 9 has been fixed for a show of Forced Spring Bulbs, with a view to specially demonstrating which varieties of Daffodils, Hyacinths, Tulips, &c., are best suited



for forcing. Exhibits of large or small collections are invited from amateurs and the trade. Medals will be awarded according to merit.

**Fruit Shows.**—In consideration of the facts (1) that the Annual Autumn Show of British-grown Fruit is every year practically a repetition of the previous year's Show; and (2) that many British-grown fruits cannot possibly be shown (or shown in perfection) at any one Show of fixed date; and (3) that Vegetables have been somewhat neglected in the past; the Council have decided to omit the great Autumn Show for one year, and in 1909 to substitute in its place a series of somewhat similar prizes for British-grown fruit and vegetables, but spread over the whole twelve months, so that everything may be seen at its best. Prizes will therefore be offered at every "Fortnightly" Show at Vincent Square during 1909, the Schedule of which will be published on February 25 in the Society's "Book of Schedules," price 6d.

**Affiliated Societies Challenge Cup.**—In connection with these fortnightly prizes the Council offer a Challenge Cup to be competed for by Affiliated Societies, hoping thereby both to stimulate the interest of the Societies concerned, and also to bring them into somewhat more intimate touch with the Parent Society. The Cup will be held for one year, and a Silver-Gilt Medal awarded to the Society winning the Challenge, and also to the Society obtaining the second place in the contest.

**New Life Fellow.**—Sir Daniel Morris, K.C.M.G., V.M.H., the Treasurer of the Society during the financially difficult years 1888 to 1891, has been appointed an Honorary Life Fellow of the Society in recognition of the great assistance he has rendered to Horticulture in various parts of the world.

**Editorship.**—Mr. Geo. S. Saunders, F.L.S., having resigned the Editorship of the *Journal*, owing to ill health, Mr. F. J. Chittenden, F.L.S., the Director of the Laboratory at Wisley, has been appointed his successor.

**Journals.**—Four parts of the *Journal* have been issued to the Fellows during the year. To secure a more frequent circulation of the Proceedings of the Society and of other information, the new Editor has been requested to publish the *Journal* in quarterly, or four-monthly, parts. The smaller and more frequent issues will undoubtedly prove more acceptable to the Fellows for general use.

**Bequest.**—The Council very much appreciate and acknowledge with warmest thanks an intimation they have received from Lady Macleay of her intention to bequeath to the Society the very valuable gift of a complete copy of Curtis's Botanical Magazine. They venture to express a hope that it may be several years yet before it comes into their possession.

**Examinations.**—The following Examinations have been held during the year:—

1 and 2. The General Examination, which is intended as a test of general horticultural knowledge. It was held in two sections, (a) for

candidates of 19 years of age and over, and (b) for those under 19 years of age. In 1909 the age limit in both sections will be 18 instead of 19.

3. The School Teachers' Examination in Cottage and Allotment Gardening.

4. The Public Parks Examination—designed for men engaged in the Parks and Gardens of Municipal and other Public Authorities.

The number of candidates at each of these examinations was large, and the results were very satisfactory.

**Examinations Abroad.**—On the invitation of the Government of the United Provinces of India, the "General Examination" of the Society in the Principles of Horticulture is to be slightly modified so as to fulfil the local Indian requirements, and a first examination will be held in April 1909 at Saharanpur. This suggests that possibly other countries and districts may feel it desirable to enter candidates for similarly modified examinations, in which case the Council would be prepared to organize them.

The examiners are leading horticulturists in England, and for examinations abroad they will be assisted by experts acquainted with the special horticultural conditions of the various countries desiring to adopt the Society's tests.

**Lectures.**—Twenty-five Lectures have been delivered before the Fellows during the year, and the Council extend their hearty thanks to those who have so kindly assisted in this very useful section of the Society's work.

**The Masters' Lectures.**—Fellows will remember the intimate connection with the Society of the late Dr. Masters, F.R.S., who did much for horticulture by drawing constant attention to the various ways in which scientific discovery and research might be made serviceable to gardening; and it will also be remembered that a fund was established by subscription to perpetuate his memory in connection with the Society, and to carry on in some degree his work of science in relation to gardening.

"The Masters' Lectures" have accordingly been founded, and the first two are to be given during 1909 by the well-known Professor Hugo de Vries, of Amsterdam, on (a) "Masters' 'Vegetable Teratology'" (June 22), and (b) "The Production of Horticultural Varieties" (September 28).

**The Nicholson Memorial.**—The Council have been requested to raise a fund for the establishment of a permanent memorial of the late Mr. George Nicholson, V.M.H., F.L.S. With this they most cordially agree. There are few, if any men, to whom the present generation of gardeners owes a deeper obligation than to the author of "The Dictionary of Gardening," a work which "has done more towards the standardization of plant names and developing an interest in horticulture than anything published since Loudon," in 1829.

Mr. Nicholson was for many years a most valued member of the Scientific Committee of our Society. He also took a very active part



and keen interest in the re-establishment of examinations by the Society, and himself acted as one of the examiners. It is in view of this last point and after carefully estimating the amount likely to be subscribed, that the Council propose to establish a "Nicholson Prize," to be awarded annually to the students at Wisley.

Subscriptions should be sent addressed "The Nicholson Prize Fund, R.H.S. Office, Vincent Square, London," and cheques and postal orders made payable to "The Royal Horticultural Society," crossed "London and County Bank."

**The Darwin Centenary.**—The Centenary Celebration of the birth year of Charles Darwin is to be held at Cambridge on June 22, the date curiously coinciding with the 50th anniversary of the publication of his "Origin of Species." Representatives of Universities and other learned bodies, together with distinguished individuals, have been invited by the University of Cambridge to take part in the festival, and the Rev. Prof. George Henslow, M.A., V.M.H., has been appointed to represent the Royal Horticultural Society.

**Classification of Daffodils.**—At the request of the Daffodil Committee the Council appointed a Committee to consider the best way of avoiding the confusion, and consequent disputes, likely to arise from the recent multitudinous crossing, recrossing, and intercrossing of the old Divisions of Magni- Medio- and Parvi-Coronati. The Committee have delivered their Report instituting an entirely new system of classification, which the Council have accepted, and ordered to be used at the Society's Shows. The Report contains a list of every Daffodil known to the Committee, together with the name of the raiser as far as it could be discovered, each flower known being allotted to its appropriate class. The Report has been printed in a handy book form, and can be obtained from the Society's Office, Vincent Square, at a cost of 1s. Experience may probably suggest some further modification of the new classification, which, for the present, has been experimentally adopted.

**Colour Chart.**—Hardly a gardener or florist exists who has not at times longed for a COLOUR CHART—that is to say, for a standard of reference whereby he could himself name, or recognize, or convey to a friend at a distance, the *exact* shade of colour of a flower he desired to procure or had seen advertised, or wished to describe to a friend.

The Council have long felt the need of such a chart, but the expense of producing it has hitherto deterred them from issuing it.

Not long since a most admirable chart, containing more than 1,450 shades of colour between white and black, was published in France at the instance of the French Chrysanthemum Society, the price in England being £1 1s. net, and, by it, it is now possible to *exactly* recognize, or describe to a friend or purchaser at a distance, the precise colour of any possible flower.

Recognizing both the excellence and the usefulness of this chart, the idea at once occurred, Could it not be adopted as an International Standard, so that all lovers of flowers all over the world could accurately and exactly describe to one another (no matter how far away or speaking



what language) the colour and shade of any particular flower they refer to? There seemed no other difficulty than the somewhat prohibitive cost of £1 1s. net. By undertaking to be responsible for a very large number, the Society is now in a position to offer this Chart to its Fellows at the reduced cost of 14s. 6d., for which price it can be obtained at the Society's Offices, Vincent Square, or it can be sent free by post for 15s.; but in all cases a cheque or postal order must be sent beforehand.

The Council hope that Fellows will avail themselves of this offer, as unless a large number of copies are purchased a considerable loss will accrue to the Society.

**The 1909 Code of Rules for Judging.**—The Society's Code of "Rules for Judging" has again been carefully revised and many alterations and additions suggested by the last few years' experience have been adopted. The Council cannot too strongly recommend a careful perusal of the Code (price 1s. 6d.) to the Secretaries of all local shows and their exhibitors.

**Conference on Spraying.**—A useful and important Conference on the spraying of Fruit Trees was held on October 16, when papers were read by Mr. Geo. Massee, V.M.H., Mr. H. F. Getting, Mr. F. V. Theobald, M.A., and Mr. Geo. Hammond, to whom the Council are greatly indebted. They also desire to acknowledge with thanks the Chairmanship of Colonel Warde, M.P., and Colonel Long, M.P., at the morning and afternoon sessions. Discussions followed the various papers; and the full text of the Conference will be found in the Society's Journal, Volume xxxiv., Part 3.

**Obituary.**—Each year removes from the Society's list of Fellows names which have appeared for a long succession of years, and by their removal the Society is so much the poorer. We are no longer able to record the Fellowship of the late Duke of Devonshire, whose tenant the Society was for so long at Chiswick; The Earl of Annesley, a past Member of the R.H.S. Council; Mr. Martin R. Smith, V.M.H., the prince of modern Carnation growers; Mr. Geo. Nicholson, V.M.H., F.L.S., for many years Curator of Kew, a member of our Scientific Committee and one of our Examiners in Horticulture, and the author of "The Dictionary of Gardening"; Sir Henry Lawrence, Bart., Sub-Treasurer of the Inner Temple; Mr. Henry Balderson, for years a Vice-Chairman of the Fruit Committee, and Mr. R. Lye, a member of the same Committee at the time of his death. Amongst other missing names are those of Sir William B. Avery, Bart., the Hon. Mrs. Barton, Major-General H. P. Bishop, Dr. E. Bonavia (of the Scientific Committee), the Dowager Marchioness of Conyngham, the Marquis E. de la Valette, Lady Farquhar, General Sir Reginald Gipps, K.C.B., the Dowager Lady Loder, Colonel Sir William T. Makins, Bart., Lieut.-Col. John Moore-Brabazon, the Earl of Rosse, F.R.S., the Hon. Mrs. E. Stanhope, Sir Condie Stephen, K.C.V.O., C.B., Mrs. Towrey White, Sir F. W. Wigan, Bart., Frau Ida Brandt, the Marquis de Wavrin, the Rev. F. Paynter and Mr. E. Fison.

**Retiring Members of the Council.**—Sir Trevor Lawrence, Bart., K.C.V.O., V.M.H., Mr. George Bunyard, V.M.H., and Mr. A. H. Pearson retire from Office. The first two have allowed themselves to be re-nominated. It is with great regret to the Council that Mr. A. H. Pearson, who has occupied a seat at the Council Table for 10 years, finds himself unable to continue in office any longer. He has, during those years, done excellent work for the Society, and deserves the warmest thanks of the Fellows.

**Victoria Medal of Honour.**—During the past year two vacancies in the roll of the Victoria Medal of Honour have occurred (through the loss of Mr. R. Martin Smith and Mr. George Nicholson), and Sir Jeremiah Colman, Bart., and Mr. Chas. Ross have been appointed by the Council to this distinction.

**New Certificate.**—Of late years the want has been increasingly felt of some way of recognizing skilful scientific work amongst plants. Even if such work does not immediately result in any great Horticultural advance, it may either disclose the steps by which existing results have been attained, or it may lay the foundation and prepare the way for future development; and is, in either case, deserving of the Society's recognition. To meet this want the Council have created a New Certificate, to be called "The Certificate of Appreciation."

**Annual Progress.**—The following table will show the Society's progress in regard to numerical strength during the past year:—

| LOSS BY DEATH IN 1908. |            |      |       | FELLOWS ELECTED IN 1908. |                            |        |       |
|------------------------|------------|------|-------|--------------------------|----------------------------|--------|-------|
|                        |            | £    | s. d. |                          |                            | £      | s. d. |
| Life Fellows . . . .   | 13 . . . . | 0    | 0 0   | Hon. Members . . . .     | 5 . . . .                  | 0      | 0 0   |
| 4 Guineas . . . . .    | 2 . . . .  | 8    | 8 0   | 4 Guineas . . . . .      | 6 . . . .                  | 25     | 4 0   |
| 2 " . . . . .          | 40 . . . . | 84   | 0 0   | 2 " . . . . .            | 601 . . . .                | 1,262  | 2 0   |
| 1 " . . . . .          | 75 . . . . | 78   | 15 0  | 1 " . . . . .            | 589 . . . .                | 618    | 9 0   |
|                        | 130        | £171 | 3 0   | Associates . . . . .     | 42 . . . .                 | 22     | 1 0   |
|                        |            |      |       | Affiliated Societies . . | 32 . . . .                 | 33     | 12 0  |
|                        |            |      |       | Commutations . . . .     | 8 . . . .                  |        |       |
|                        |            |      |       |                          | = £197 8s. 0d. . . }       |        |       |
|                        |            |      |       |                          | 1,283                      | £1,961 | 8 0   |
|                        |            |      |       |                          | Deduct Loss . . . .        | 953    | 8 0   |
|                        |            |      |       |                          | NET INCREASE IN INCOME     | £1,008 | 0 0   |
|                        |            |      |       |                          | New Fellows, &c. . . .     | 1,283  |       |
|                        |            |      |       |                          | Deaths and Resignations .  | 776    |       |
|                        |            |      |       |                          | NUMERICAL INCREASE . .     | 507    |       |
|                        |            |      |       |                          | Total on December 31, 1907 | 10,000 |       |
|                        |            |      |       |                          | Total on December 31, 1908 | 10,507 |       |

| LOSS BY RESIGNATION, &c. |             |      |       |
|--------------------------|-------------|------|-------|
|                          |             | £    | s. d. |
| 4 Guineas . . . . .      | 1 . . . .   | 4    | 4 0   |
| 2 " . . . . .            | 107 . . . . | 224  | 14 0  |
| 1 " . . . . .            | 489 . . . . | 513  | 9 0   |
| Associates . . . . .     | 22 . . . .  | 11   | 11 0  |
| Affiliated Societies . . | 27 . . . .  | 28   | 7 0   |
|                          | 646         | £782 | 5 0   |
| TOTAL LOSS               | 776         | £953 | 8 0   |

The Council are pleased to record that the total number of Fellows, Honorary or Corresponding Members, Associates and Affiliated Societies is now 10,507, which is believed to be the highest number belonging to any British Royal Society.

**Letting of the Hall.**—The Annual Revenue and Expenditure Account indicates the continued success of the Hall as a financial asset. No fewer than 52 engagements (excluding the Society's own Shows), covering a total of 160 days, have been accommodated, and the amount

Dr.

## ANNUAL REVENUE AND EXPENDITURE

|                                                                          | £     | s. | d. | £       | s. | d. |
|--------------------------------------------------------------------------|-------|----|----|---------|----|----|
| To ESTABLISHMENT EXPENSES—                                               |       |    |    |         |    |    |
| Ground Rent ... ..                                                       | 690   | 0  | 0  |         |    |    |
| Rates and Taxes ... ..                                                   | 590   | 12 | 4  |         |    |    |
| Water Rate ... ..                                                        | 83    | 12 | 9  |         |    |    |
| Electric Lighting ... ..                                                 | 217   | 14 | 4  |         |    |    |
| Gas ... ..                                                               | 30    | 9  | 6  |         |    |    |
| Insurance ... ..                                                         | 49    | 19 | 9  |         |    |    |
|                                                                          |       |    |    | 1,662   | 8  | 8  |
| Salaries and Wages ... ..                                                | 1,750 | 17 | 0  |         |    |    |
| Printing and Stationery ... ..                                           | 817   | 16 | 0  |         |    |    |
| Postages ... ..                                                          | 406   | 19 | 11 |         |    |    |
| Fuel ... ..                                                              | 48    | 12 | 6  |         |    |    |
| Architect and Auditor's Fees ... ..                                      | 117   | 4  | 2  |         |    |    |
| Gratuities ... ..                                                        | 9     | 4  | 0  |         |    |    |
| Repairs and Renewals ... ..                                              | 251   | 19 | 4  |         |    |    |
| Miscellaneous Expenses ... ..                                            | 304   | 10 | 6  |         |    |    |
| Horticultural Unions ... ..                                              | 13    | 0  | 0  |         |    |    |
|                                                                          |       |    |    | 3,720   | 3  | 5  |
| „ JOURNAL, PRINTING AND POSTAGE ...                                      |       |    |    | 2,606   | 10 | 9  |
| „ PAINTING ORCHID PICTURES... ..                                         |       |    |    | 38      | 5  | 0  |
| „ WISLEY SCHOLARSHIP GIVEN BY THE SOCIETY ... ..                         |       |    |    | 25      | 0  | 0  |
| „ LINDLEY LIBRARY ... ..                                                 |       |    |    | 29      | 2  | 7  |
| „ SHOWS and MEETINGS—                                                    |       |    |    |         |    |    |
| Temple Show ... ..                                                       | 752   | 9  | 3  |         |    |    |
| Holland Park Show ... ..                                                 | 629   | 10 | 11 |         |    |    |
| Special Autumn Show ... ..                                               | 293   | 3  | 2  |         |    |    |
| Colonial Show ... ..                                                     | 79    | 19 | 6  |         |    |    |
| Labour ... ..                                                            | 162   | 17 | 8  |         |    |    |
| Expenses of Floral Meetings and Conferences                              | 97    | 1  | 11 |         |    |    |
|                                                                          |       |    |    | 2,015   | 2  | 5  |
| „ PRIZES and MEDALS—                                                     |       |    |    |         |    |    |
| Awarded at Society's Shows ... ..                                        | 469   | 13 | 5  |         |    |    |
| Awarded by Deputations at other Shows ...                                | 150   | 16 | 0  |         |    |    |
|                                                                          |       |    |    | 620     | 9  | 5  |
| „ WISLEY GARDENS—                                                        |       |    |    |         |    |    |
| Rates, Taxes, and Insurances ... ..                                      | 83    | 10 | 10 |         |    |    |
| Tithe Redemption ... ..                                                  | 250   | 0  | 0  |         |    |    |
| Superintendent's Salary ... ..                                           | 225   | 0  | 0  |         |    |    |
| Labour ... ..                                                            | 981   | 8  | 7  |         |    |    |
| Trees and Shrubs ... ..                                                  | 11    | 0  | 0  |         |    |    |
| Garden Implements ... ..                                                 | 31    | 11 | 11 |         |    |    |
| Loam and Manure ... ..                                                   | 79    | 11 | 11 |         |    |    |
| Repairs ... ..                                                           | 69    | 6  | 3  |         |    |    |
| Fuel ... ..                                                              | 198   | 5  | 0  |         |    |    |
| Miscellaneous Expenses ... ..                                            | 170   | 13 | 11 |         |    |    |
|                                                                          |       |    |    | 2,100   | 8  | 5  |
| „ COST of GROWING, PACKING, and DISTRIBUTION of PLANTS to FELLOWS ... .. |       |    |    | 313     | 5  | 5  |
| „ LABORATORY, WISLEY—                                                    |       |    |    |         |    |    |
| Salaries ... ..                                                          | 310   | 0  | 0  |         |    |    |
| Surrey County Council Scholars ... ..                                    | 22    | 10 | 0  |         |    |    |
| Miscellaneous Expenses ... ..                                            | 85    | 11 | 7  |         |    |    |
|                                                                          |       |    |    | 418     | 1  | 7  |
| „ DEPRECIATION—                                                          |       |    |    |         |    |    |
| Hall Glass Roof, Furniture, Glass Houses                                 |       |    |    |         |    |    |
| Wisley, and Plant and Materials ...                                      |       |    |    | 499     | 4  | 11 |
| „ BALANCE, carried to Balance Sheet ... ..                               |       |    |    | 7,867   | 0  | 0  |
|                                                                          |       |    |    | £21,915 | 2  | 7  |



## ACCOUNT for YEAR ending DECEMBER 31, 1908.

Cr.

|                                          | £     | s. | d. | £      | s. | d. |
|------------------------------------------|-------|----|----|--------|----|----|
| By ANNUAL SUBSCRIPTIONS ... ..           |       |    |    | 14,277 | 3  | 3  |
| „ ENTRANCE FEES ... ..                   |       |    |    | 397    | 19 | 0  |
| „ DIVIDENDS AND INTEREST ... ..          |       |    |    | 1,063  | 8  | 5  |
| „ SHOWS AND MEETINGS—                    |       |    |    |        |    |    |
| Temple Show ... ..                       | 1,535 | 14 | 0  |        |    |    |
| Holland Park Show ... ..                 | 496   | 18 | 0  |        |    |    |
| Special Autumn Show ... ..               | 38    | 5  | 0  |        |    |    |
| Colonial Show ... ..                     | 68    | 16 | 0  |        |    |    |
| Takings at Hall Shows ... ..             | 226   | 14 | 2  |        |    |    |
|                                          |       |    |    | 2,366  | 7  | 2  |
| „ JOURNALS AND OTHER PUBLICATIONS—       |       |    |    |        |    |    |
| Advertisements ... ..                    | 911   | 18 | 6  |        |    |    |
| Sale of Journals ... ..                  | 191   | 15 | 2  |        |    |    |
|                                          |       |    |    | 1,103  | 13 | 8  |
| „ HALL LETTINGS ... ..                   | 2,206 | 2  | 9  |        |    |    |
| <i>Less</i> Labour Expenses ... ..       | 138   | 7  | 2  |        |    |    |
|                                          |       |    |    | 2,067  | 15 | 7  |
| „ PRIZES AND MEDALS ... ..               |       |    |    | 175    | 4  | 9  |
| „ EXAMINATIONS IN HORTICULTURE—          |       |    |    |        |    |    |
| Amount received in Fees ... ..           | 154   | 0  | 0  |        |    |    |
| <i>Less</i> expended ... ..              | 77    | 11 | 1  |        |    |    |
|                                          |       |    |    | 76     | 8  | 11 |
| „ WISLEY GARDENS—                        |       |    |    |        |    |    |
| Produce sold ... ..                      | 37    | 0  | 10 |        |    |    |
| Students' Fees ... ..                    | 68    | 5  | 0  |        |    |    |
| Inspection of Gardens ... ..             | 255   | 11 | 0  |        |    |    |
|                                          |       |    |    | 360    | 16 | 10 |
| „ LIFE COMPOSITIONS—                     |       |    |    |        |    |    |
| Being amount paid by Fellow now deceased |       |    |    | 26     | 5  | 0  |

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 £21,915 2 7

Dr.

## BALANCE SHEET.

[illegible]

DECEMBER 31, 1908.

Cr.

|                                                                                                                             | £      | s. | d. | £       | s. | d. |
|-----------------------------------------------------------------------------------------------------------------------------|--------|----|----|---------|----|----|
| By CAPITAL EXPENDITURE—                                                                                                     |        |    |    |         |    |    |
| „ NEW HALL AND OFFICES—                                                                                                     |        |    |    |         |    |    |
| As at December 31, 1907 ... ..                                                                                              | 40,376 | 15 | 5  |         |    |    |
| Expenditure since on New Kitchen, Awning,<br>Lavatory, &c. ... ..                                                           | 573    | 15 | 9  |         |    |    |
|                                                                                                                             |        |    |    | 40,950  | 11 | 2  |
| „ FURNISHING THE HALL AND OFFICES—                                                                                          |        |    |    |         |    |    |
| As at December 31, 1907 ... ..                                                                                              | 2,088  | 5  | 6  |         |    |    |
| Expenditure since on Oak Cupboard, Type-<br>writer, and Kitchen Fittings ... ..                                             | 77     | 0  | 11 |         |    |    |
|                                                                                                                             |        |    |    | 2,165   | 6  | 5  |
| „ DWELLING HOUSES, WISLEY—                                                                                                  |        |    |    |         |    |    |
| As at December 31, 1907 ... ..                                                                                              |        |    |    | 2,390   | 5  | 7  |
| „ GLASS HOUSES AND RANGES, WISLEY ...                                                                                       |        |    |    | 3,295   | 15 | 2  |
| „ LABORATORY, WISLEY—                                                                                                       |        |    |    |         |    |    |
| As at December 31, 1907 ... ..                                                                                              | 1,427  | 14 | 1  |         |    |    |
| Expenditure since on Architect's Fees and<br>New Boiler ... ..                                                              | 200    | 0  | 10 |         |    |    |
|                                                                                                                             |        |    |    | 1,627   | 14 | 11 |
|                                                                                                                             |        |    |    | 50,429  | 13 | 3  |
| „ PLANT AND MATERIALS—                                                                                                      |        |    |    |         |    |    |
| Appliances for Shows ... ..                                                                                                 | 236    | 11 | 0  |         |    |    |
| Fittings, Wisley ... ..                                                                                                     | 58     | 8  | 6  |         |    |    |
| Horse and Cart and Garden Plant, &c. ...                                                                                    | 92     | 13 | 6  |         |    |    |
| Fencing and Wire Netting, Wisley ... ..                                                                                     | 36     | 15 | 0  |         |    |    |
| Scientific Instruments and Fittings, Laboratory                                                                             | 170    | 4  | 5  |         |    |    |
| Breakable Apparatus, Laboratory ... ..                                                                                      | 95     | 2  | 4  |         |    |    |
|                                                                                                                             |        |    |    | 689     | 14 | 9  |
| „ SUNDRY DEBTORS ... ..                                                                                                     |        |    |    | 757     | 0  | 8  |
| „ INVESTMENTS—                                                                                                              |        |    |    |         |    |    |
| 2½ % Consols, £10,576 3s. 11d. ... cost                                                                                     | 9,960  | 4  | 9  |         |    |    |
| (£2,022 8s. 9d. of this sum is held by the<br>Society, subject to the provisions of the will<br>of the late J. Davis, Esq.) |        |    |    |         |    |    |
| £7 Annuity East Indian Railway, Class B,<br>Williams' Memorial Fund ... ..                                                  | 168    | 0  | 0  |         |    |    |
| 3 % Local Loans, £5,800 ... .. cost                                                                                         | 6,006  | 16 | 6  |         |    |    |
| 3½ % Indian Rupee Paper, 37,000 Rupees ..                                                                                   | 2,462  | 14 | 4  |         |    |    |
| 4 % Canadian Inscribed Stock £2,000 ..                                                                                      | 2,077  | 11 | 0  |         |    |    |
| 2½ % National War Loan, £5,108 12s. 11d. ..                                                                                 | 5,000  | 0  | 0  |         |    |    |
| 4 % Canadian Pacific Rly. Co. Consolidated<br>Debenture Stock, £4,632 ... .. cost                                           | 4,999  | 14 | 1  |         |    |    |
| 3½ % London County Council Inscribed<br>Stock, £3,000 ... .. cost                                                           | 3,020  | 13 | 6  |         |    |    |
| 2½ % Midland Rly. Preference Stock, £400<br>Masters' Memorial Fund ... ..                                                   | 290    | 13 | 6  |         |    |    |
|                                                                                                                             |        |    |    | 33,986  | 7  | 8  |
| <i>The approximate value of these Investments<br/>is £31,623 16s.</i>                                                       |        |    |    |         |    |    |
| „ CASH—                                                                                                                     |        |    |    |         |    |    |
| At Bank ... ..                                                                                                              | 436    | 16 | 4  |         |    |    |
| On Deposit ... ..                                                                                                           | 1,500  | 0  | 0  |         |    |    |
| In Hand ... ..                                                                                                              | 26     | 4  | 6  |         |    |    |
|                                                                                                                             |        |    |    | 1,963   | 0  | 10 |
|                                                                                                                             |        |    |    | £87,825 | 17 | 2  |

I have audited the books from which the foregoing Accounts are compiled, and certify that they exhibit a true and correct statement of the position of the Society on December 31, 1908.

ALFRED C. HARPER, F.C.A., Auditor (HARPER BROTHERS),  
Chartered Accountant, 10 Trinity Square, E.C.

January 13, 1909.



received (about £2,067) compares favourably with the year 1907, especially when it is remembered that the former year had two lettings of a value of £700, which have not recurred. The awning over the main entrance, and the kitchen constructed in the basement during the past twelve months, still further improve the comfort of the lessees. Bronze Standard Lamps are also to be erected at the main entrance. There are but few vacant dates left in the year 1909, and a good financial return is again anticipated.

**Committees, &c.**—The hearty thanks of the Society are again due to the Members of the Committees, the Judges, the Writers of Papers for the Journal, the Compilers of Abstracts, the Reviewers, the several Examiners, and to the many others who, during the past twelve months, have done so much to contribute to the success of the Society's work, and to help maintain the high reputation it holds among the practical and scientific Societies of the World.

By Order of the Council,  
W. WILKS, *Secretary*.

ROYAL HORTICULTURAL SOCIETY,  
VINCENT SQUARE, WESTMINSTER, S.W.  
*December 31, 1908.*

## GENERAL MEETING.

FEBRUARY 23, 1909.

SIR ALBERT K. ROLLIT, LL.D., in the Chair.

*Fellows elected* (61).—Mrs. Harold Agar, F. Barchard, Mrs. H. J. Barnes, Mrs. S. Berkeley, Mrs. Wilfred Buckley, E. Russell Burdon, A. P. Caldwell, F. Carr, Miss C. Champernowne, Miss M. Cotesworth, Mrs. Dewhurst, A. Herbert Empson, Sir R. U. Penrose FitzGerald, Bart., W. Forster, Arden Franklyn, C. Friswell, Miss M. Froude, Mrs. Gartside-Tipping, Edgar Gibson, W. Giles, A. W. Gilmour, F. Green, G. G. Hamilton, Mrs. Herring, Mrs. Andrew Hichens, W. Homewood, Martin Hopkinson, Mrs. Ernest Hutton, Rev. T. Arnold Hyde, Mrs. Jeffcock, Alfred Johnson, C. J. Jones, Mrs. H. S. Kaylor, Miss MacBrayne, Mrs. H. E. Mitchell, Miss Monk, W. S. Murray, Arthur Neeves, Mrs. Peacock, W. Peck, Mrs. Reid, Godfrey E. Reiss, Mrs. Richardson, L. Ridout, Miss P. Scott-Thomson, Mrs. Skinner, Joseph Slinger, Miss J. L. Sleigh, Col. H. H. Smythe, T. S. Stewart-Smith, Mrs. Stirling of Fairburn, Miss C. E. Story, Mrs. Francis Tennant, W. G. Tester, Mrs. Thomson, Mrs. H. H. Turner, Mrs. Waddingham, Mrs. Paul Waterhouse, Mrs. Williams, James Wilson, Richard Windover.

*Fellows resident abroad* (4).—Miss E. Hoyt (New York), Miss G. Durant Rice (New York), Lieut.-Col. G. Rippon (Burma), R. Seller (Cape Colony).

*Associate* (1).—C. Stone.

*Societies affiliated* (3).—Bushey Cottage Gardening Society; Stulterheim (Cape Colony) Horticultural Society; Sunbury Horticultural Society.

A lecture was given on "A Camping Tour through Syria to Petra in Arabia" by Mr. Arthur W. Sutton, J.P., F.L.S., V.M.H.

## GENERAL MEETING.

MARCH 9, 1909.

Rev. JOSEPH JACOB in the Chair.

*Fellows elected* (57).—Mrs. W. H. Addleshaw, C. J. M. Adie, J. G. Aikin, Mrs. T. Bayly, E. A. Birch, Hamilton Blanchard, Miss Brocklehurst, Mrs. Boyd Browning, P. Caldecott, W. Camm, L. G. A. Collins, Commander Crease, R.N., G. Cunningham, Mrs. Dale, Miss T. D. Epps, Mrs. W. Freeman, William Freeman, Mrs. R. C. Foster, F. A. Gale, Henry C. Green, R. Strangman Griffin, Leslie Greening, D. G. Guild, Rev. John Hardy, F. G. Henson, M. Davenport Hill, H. Reid Inman, Miss H. E. Ionides, Mrs. Jameson, Godfrey Leach, J. G. Le Marchant, Miss A. Letts, Miss Lowndes, Geoffrey Lubbock, John McHarg, Miss A. Maxwell, F. A. N. Newdegate, M.P., Mrs. C. L. Norman, M. Harcourt Paine, Miss L. Palmer, S. W. Parflect, R. Parish, Miss G. Prideaux-Brune, Sir Henry B. Robertson, E. H. Robertson, H. W. B. Robinson, Mrs. Roxburgh, H. N. Sherwin-White, Mrs. Morton Smith, Thomas Taylor, Mrs. C. Theobald, Alfred Tidy, W. E. Trevethick, Walter Trower, Capt. V. N. Ward, Miss R. Wood, Mrs. Henry Woodall.

*Fellows resident abroad* (3).—A. Koenemann (Germany), C. F. A. van der Sluys (Guernsey), A. Spencer Watts (Sydney, N.S.W.).

*Societies affiliated* (5).—Boston Park Horticultural Society; Highgate Horticultural Society; Machen Horticultural Society; Nelson (N. Z.) Horticultural Society; Worthing Horticultural Society.

A lecture was given on "Tulips and the Tulipomania" by Mr. W. S. Murray (see p. 18).

## GENERAL MEETING.

MARCH 23, 1909.

Rev. JOSEPH JACOB in the Chair.

*Fellows elected* (51).—Sydney E. Bates, J.P., Dr. G. Booth, J.P., Mrs. T. Foyster Bowen, Mrs. R. Bradshaw, Robert Bradshaw, Mrs. Brown, H. Buck, J. Oscar Cheadle, W. Chartres Cock, T. W. Coles, J. Abdy Combe, Charles Cranfield, Mrs. Arthur Davies, Miss A. Debenham, Mrs. H. G. Dowler, Mrs. H. Drake, George E. Dyke, Miss A. Dymes, Lady Ellis, R. G. Fugler, R. S. Geale, Thomas Glass, Lady Grenfell, Mrs. Haworth-Booth, Colonel J. H. Hogarth, Charles Humfrey, F. C. Hunter, E. James, Mrs. J. B. Kennedy, Major J. C. L. Knight-Bruce, Mrs. Lacon-Gordon, G. Lewis, Mrs. Leycester, Mrs. W. Park Lyle, Mrs. H. Victor Macdona, Mrs. Maconachie, Mrs. May, H. Mayne, L. B. Meredith, Godfrey Oakley, Miss Patchett, Lady Kathleen Pilkington,

Mrs. J. Holmes Poulter, H. Preston, Mrs. C. F. Rawson, Mrs. Sansom, P. Kerr Smiley, Mrs. E. J. Stannard, Mrs. Stutchbury, Lady Edmund Talbot, Herbert H. Walford, J.P.

*Fellows resident abroad* (7).—A. A. Benson (Brisbane), Gustave Croux (France), N. C. Ghosh (India), A. Gravereau (France), Miss C. E. Hulbert (Geneva), D. McCullum (Johannesburg), Louis Voraz (France).

*Associate* (1).—Miss J. Dyer.

*Societies affiliated* (3).—Brewood Horticultural Society, Doncaster Horticultural Society, Stratford Horticultural Society.

A lecture was given on "Rock Gardens—Natural and Artificial" by Mr. R. Lloyd Praeger, B.A.

## DEPUTATION TO THE BERLIN INTERNATIONAL EXHIBITION.

APRIL, 1909.

What may be regarded as the great International Horticultural Exhibition of the year 1909 was held at Berlin in the beginning of April last.

The *Grosse Internationale Gartenbau Ausstellung* was organized by the Royal Prussian Horticultural Society, which deserves to be congratulated on the results of its efforts and the unqualified success of the undertaking.

The building selected for the Exhibition consisted of two lofty halls at the *Ausstellungshallen*, adjoining the grounds of the Berlin Zoological Gardens. These halls are within easy reach of all parts of the City by rail and tram, and have been specially constructed for Exhibition purposes. They cover altogether about two and a half acres. In addition to the extensive floor space there are side aisles, spacious galleries, separate rooms and annexes, affording complete accommodation for all kinds of exhibits, also facilities for visitors to obtain a good general view of the collections, as well as access to all the novelties.

The total amount offered for competitions and prizes by the Society and others amounted to about £3,600.

This was practically the first attempt made in Berlin to hold a great International Horticultural Exhibition. The Royal Prussian Horticultural Society, which undertook charge of it, is a comparatively small Society, numbering about 1,000 members, with a subscription of twenty marks annually (a little over £1). In spite of this, the Exhibition was extremely well organized, and it appeared to receive the hearty support of the leading people throughout Germany. The list of guarantors was strikingly large.

At the invitation of the Council the following countries sent special representatives to be present at the opening ceremony and to take part in the social and other functions associated with it, viz.: France, Belgium, Holland, Sweden, Russia, Denmark, Italy, and Great Britain. The representatives of the Royal Horticultural Society were Sir Daniel Morris, K.C.M.G., V.M.H., and Mr. Harry J. Veitch, F.L.S., V.M.H., but owing



to illness Mr. Veitch at the last moment was unable to attend. In addition there were 150 jurors, or judges, to whom was entrusted the onerous duty of awarding prizes and awards in the thirty-one sections of the Show. The following gentlemen officiated as English jurors, viz.: Mr. William Watson, A.L.S., Royal Gardens, Kew; Mr. Stuart H. Low (Enfield); Mr. Louis Sander (St. Albans); Mr. S. T. Wright (Royal Horticultural Society); and Mr. R. Hooper Pearson, of the *Gardeners' Chronicle*.

It was estimated that about two-thirds of the total exhibits were contributed by German horticulturists, and one-third by those of other countries. Great Britain on this occasion was not so largely represented as was anticipated, but the exhibits sent by Messrs. Charlesworth (Orchids), Mr. C. Engelmann, Mr. G. Lange (Carnations), and Messrs. Cannell (Pelargoniums) attracted evident attention. The Winter-Flowering Carnations exhibited by Mr. Lange and Mr. Engelmann were marked features in their class.

The Exhibition was privately visited by their Imperial Majesties the Emperor and Empress on Wednesday, March 31, and it was formally opened to the public on Friday, April 2, by their Imperial Highnesses the Crown Prince and Princess, who, after receiving the several foreign and other representatives, were presented with an address and conducted over the Exhibition by the President and other Officers of the Society.

Before referring to some of the most striking features of the Exhibition, it should be mentioned that the three special Grand Prizes offered for open competition were awarded by a ballot of all the jurors as follows: The Emperor's Grand Prize for the best exhibit of cultural methods to Count Manfred von Matuschka, of Silesia, for a fine exhibit of Winter-Flowering Carnations.

The Crown Prince and Princess' Grand Prize for the best complete group in the Show was awarded to Mr. Adolph Koschel, Charlottenburg, while the Society's large Gold Medal for the best decorative exhibit was awarded to the Dutch Bulb Growers' Association for a large and striking parterre of Hyacinths representing a terrace garden with an area of about 400 square yards with about 20,000 brightly coloured plants in beautiful bloom.

Among Orchids by far the largest and choicest collection was exhibited by Mons. F. Lambeau, of Brussels.

Mr. Otto Beyrodt was the chief German exhibitor of Orchids, while, as already mentioned, Messrs. Charlesworth had a small collection of some of their best varieties, including a striking plant of *Odontoglossum Ossulstonii* with over forty flowers.

There were moderately large collections of Palms, Cycads, and foliage plants. Possibly the finest was that of the Société Anonyme Horticole of Ghent; and "Le Lion" had a fine group of *Cocos Weddelliana*.

The stove flowering plants formed an interesting display. Bromeliads were shown by Mr. Firmin de Smet, of Ghent, whose specimen of *Tillandsia zebrina* was particularly good. The Hippeastrums were in considerable quantity, but, with the exception of the collection from Mr. Voorschoten, of the Hague, they were not equal to those usually seen at the Shows of the Royal Horticultural Society.

As already mentioned, the collections of Hyacinths and Tulips formed

a special feature of the Exhibition; and they were probably the most decorative of any, well deserving the Grand Prize awarded them by the general vote of the jurors.

The finest group of Roses was planted out as in a Rose garden, and included standard and climbing plants of all the popular sorts. The chief prize winner was Mr. Adolph Koschel, of Charlottenburg.

Amongst attractive novelties were *Impatiens Holstii Liegnitzia*, a dwarf and very brightly coloured variety; the wonderful collection of varieties of *Gerbera* by M. R. Adnet, of Cap d'Antibes, including pure white, yellow, orange, rose, red, and rich crimson flowers; *Cordylone Bruantii variegata* shown by Emil Vercauteren; a fine form of 'White Pearl' *Rhododendron* by Messrs. C. B. van Nes & Son; a magnificent group of *Azaleas* by Mr. T. J. Seidel, of Dresden, which occupied the floor area in the large hall; the several groups of *Primula obconica*, the flowers of which were described as "surpassing in size and colour anything yet exhibited in London"; the large and singularly interesting collections of hardy fruits with thousands of handsome specimens of Apples, Pears, and Quinces in excellent condition for the time of year; and the large exhibits of vegetables, contributed chiefly by Dutch growers.

In addition to the Exhibition briefly described above, on April 7 there was opened another Exhibition, or "Floral Display," consisting of arrangements of flowers bringing into prominence the association of poetical or symbolical ideas with certain classes of plants. A descriptive account of this appeared in the *Gardeners' Chronicle* of April 17, p. 249.

There were several social functions to which the foreign and other representatives were invited and hospitably entertained during their visit.

On Thursday, April 1, the jurors, after completing their arduous duties at the Exhibition, were entertained at luncheon by the President and Officers of the Society. On Friday the representatives and jurors were invited to be present at the formal opening of the Exhibition by the Imperial Crown Prince and Princess. In the evening of the same day the foreign guests attended a performance of Verdi's Opera of *Aida*. On Saturday evening the Exhibition Festival Dinner took place at the Chief Restaurant attached to the Zoological Gardens. The President (Herr Malther Swaboda), the Vice-President (Herr A. Brodersen), and a distinguished party "welcomed the guests." Appropriate speeches and responses were made by the representatives of each country. Sir Daniel Morris, K.C.M.G., V.M.H., responded to the toast of "British Horticulture," and expressed his appreciation of the hospitality extended to the visitors from this country. On Sunday and Monday excursions were organized to the Imperial Gardens at Potsdam and the recently established Botanic Gardens at Dahlem.

There is little doubt that this great International Exhibition, whether a financial success or not, will have had a great influence on the development of German horticulture, and thus the main objects of its promoters will be fully achieved. It was the general opinion of the English visitors that such an Exhibition afforded a valuable object-lesson as to the best means of organizing and carrying into effect large undertakings of this kind and ensuring unqualified success.



It is admitted that International Exhibitions can only be occasional events. The expenses involved must always be very considerable, while a prodigious amount of detailed work falls on those concerned as well as the risk of financial loss. There can be no doubt, however, as to the great national value of such Exhibitions. In spite of the admitted eminence of English horticultural practice a well organized and successful International Exhibition held in London in a building sufficiently large and accessible to the general public would be likely to bring before the horticulturists of this country numerous points on which they have still something to learn.

It is well known that at the large Exhibitions held on the Continent there is striking evidence of artistic effects and general harmony, produced with plants that are possibly not of the same intrinsic value as many grown in these islands. If such effects in arrangement could be introduced and generally adopted here, they would add materially to the success already attained by our Exhibitions and prove of great value in promoting the further progress of our national horticulture.

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### GENERAL MEETING.

APRIL 6, 1909.

Professor G. S. BOULGER, F.L.S., in the Chair.

*Fellows elected* (53).—Miss M. Anderson, Mrs. W. R. Anderson, Miss Bashford, G. E. Booker, E. J. Brook, C. Brown, F. C. Burgess, Mrs. G. Dance, Mrs. De Knoop, W. Denman, R. Adam Ellis, H. M. Farrer, Miss Irene Fergusson, Mrs. G. H. Finch, Mrs. Foyer, R. G. Francis, J. Friedlander, Mrs. Gartside, H. J. Godin, Mrs. G. Gomm, Rev. A. Hankey, Miss M. E. Haviland, Mrs. Hawkes, R. Heywood, A. Holt, Miss A. Hutchinson, Mrs. Jardine, Mrs. Bulkeley Johnson, Miss Keating, Mrs. John Kemp, Mrs. R. B. Knatchbull-Hugessen, Lady Loreburn, Miss M. H. McDonnell, Hon. Helen Macnaghten, Mrs. H. J. Mappin, Mrs. R. Moon, F. W. Mugford, Libert Oury, J. S. Parker, F. W. Parsons, G. Wyatt Peachey, H. M. Phipson, Mrs. G. P. Pierce, W. P. Pinder, Mrs. Prankerd, A. Reiss, Mrs. F. M. Robinson, Mrs. J. Robinson, Mrs. A. A. Steel, T. Stevenson, A. Stunt, Mrs. M. Tristram, Mrs. M. R. Trower.

*Fellows resident abroad* (2).—R. S. Falcon (British Columbia), S. C. De Udyanvinode (India).

*Societies affiliated* (3).—Marlow Horticultural Society, Somerset Agricultural Association, Victoria Horticultural Society.

A Lecture was given on "Illustrations of the Effects of the Forces of Growth" by the Rev. Professor G. Henslow, F.L.S., V.M.H. (see p. 9).

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### GENERAL MEETING.

APRIL 20, 1909.

Mr. GEORGE PAUL, J.P., V.M.H., in the Chair.

*Fellows elected* (44).—C. H. Bloom, J. Boulter, Mrs. Allen Brown, Mrs. Ulick Burke, Miss M. Chappell, Rev. L. C. Chalmers-Hunt, W. B.



Christopherson, Mrs. Coddington, John Coutts, C. Luxmore Drew, Hon. Mrs. Duberly, Miss D. R. George, Miss Gorringer, Mrs. J. M. Harrison, Miss D. Heywood, Mrs. G. F. Hodder, C. Henry House, Miss A. L. Howard, Miss J. Howard, Mrs. Jump, Mrs. Hugh Kirk, E. A. C. Lloyd, R. McConnell, H. P. Miles, Mrs. E. Morrison-Bell, Miss M. R. Murray, Mrs. Myers, Miss R. E. Peyman, Mrs. Henry Powell, Mrs. A. Praed, Owen Roberts, T. J. Russell, A. E. Rutter, C. P. Sandberg, Dr. John Scott, Mrs. Slattery, Mrs. W. Sykes, A. Taylor, T. Merchant Taylor, Miss M. Thom, C. Twietmeyer, Mrs. E. F. White, Mrs. E. Wilberforce, Rev. P. T. Williams.

*Fellow resident abroad* (1).—M. Cumming, B.A., B.S.A. (Nova Scotia).

*Associate* (1).—S. N. Mukherji, B.A.

*Society affiliated* (1).—Dartford Horticultural Society.

A lecture was given on "Pansies" by Mr. Eric Drabble, D.Sc., F.L.S.

## DEPUTATION TO BIRMINGHAM.

APRIL 22 AND 23, 1909.

IN response to an invitation from the Midland Daffodil Society a Deputation visited Birmingham on the occasion of the Midland Daffodil Show, held in the Botanical Gardens on Thursday and Friday, April 22 and 23. The Council appointed Mr. H. B. May, Mr. E. A. Bowles, Mr. A. Kingsmill, and Mr. C. H. Curtis to act as the Deputation.

The exhibition was a very fine one both in quality and extent, and everything possible was done for the convenience and comfort of the Deputation. On the eve of the exhibition the Treasurer of the Midland Society, Mr. Robert Sydenham, and Mrs. Sydenham entertained the Deputation and several notable Daffodil raisers to dinner at their home, and at the close of the first day they again entertained the Deputation, together with the Officers and Committee of the Midland Society, and all the exhibitors who were able to stay, at dinner in the Grand Hotel. There was a very large gathering at the latter function, under the presidency of Mr. W. A. Milner.

A short programme of toasts followed the dinner, and in proposing "The Visitors" Mr. R. Sydenham specially welcomed the Deputation. Mr. H. B. May responded, and, as on the occasion of the official luncheon, held in the Botanical Gardens earlier in the day, he expressed thanks for the thoughtful and generous hospitality extended to them, and pointed out that the Council, as representing the parent Society, was ready and willing to do all in its power for the benefit of the Daffodil and Daffodil lovers and raisers, but they had no wish to act as an authoritative body on questions of classification and registration except at the wish and request of those specially interested in these flowers.

In the discussion which followed, the Rev. J. Jacob pointed out the great need of a recognized system of classification for Daffodils, and the equally great need of registration of varieties by an authoritative body.

He defended the New Classification issued by the Royal Horticultural Society, and urged that one flower, accompanied by a written description and a fee of 1s. or 2s. 6d., would be sufficient for registration purposes, and secure to a raiser the right to use that particular name for that particular flower. He expressed a hope that the Royal Horticultural Society might become the recognized registration authority.

With common consent the meeting did not discuss the classification question, because it was under consideration by an enlarged sub-committee appointed by the Council of the R.H.S.

There was, however, a general feeling that no name should be registered for a Daffodil unless accompanied by at least one flower, a description, and a registration fee, and that the Royal Horticultural Society should deal with the matter.

On behalf of the Council the Deputation made the following awards at the exhibition :—

*Award of Merit.*

To Narcissus 'Lowdham Beauty.'—A large creamy variety belonging to the Giant Leedsii group, from Messrs. J. R. Pearson, Lowdham, Notts. (Fig. 17.)

*Gold Medal.*

To Mr. E. M. Crosfield, Cossington House, Bridgwater, for a group of new Daffodils.

To Messrs. Cartwright & Goodwin, Kidderminster, for a collection of new Daffodils.

To Mr. Chas. Dawson, Gulval, Penzance, for a group of beautiful new seedling Daffodils.

*Silver-gilt Flora Medal.*

To Messrs. Barr, Covent Garden, for new and popular Daffodils.

To Messrs. J. R. Pearson, Lowdham, Notts., for a group of the newer and rarer Daffodils.

*Silver-gilt Banksian Medal.*

To Mr. H. D. Phillips, Olton, for a collection of newer Daffodils.

To Sir Josslyn Gore Booth, Bart., Lissadel, Sligo, for a collection of Irish-grown Daffodils.

To Mr. P. D. Williams, Caerhays, Cornwall, for new Daffodils.

To Messrs. J. Pope, Kings Norton, for a group of Daffodils.

To Messrs. Bakers, Codsall, Wolverhampton, for an exhibit of alpinas arranged in a rock garden.

To Messrs. Sutton, Reading, for an exhibit of Cinerarias and Stocks.

*Silver Flora Medal.*

To Miss F. W. Currey, Lismore, Ireland, for a group of both new and popular Daffodils.

To Mr. F. H. Chapman, Rye, for newer Daffodils.

*Silver Banksian Medal.*

To Messrs. R. H. Bath, Wisbech, for a group of Daffodils.

To Mr. Robert Sydenham, Tenby Street, Birmingham, for a group of Daffodils, Tulips, and Lily-of-the-Valley grown in moss-fibre in undrained pots.

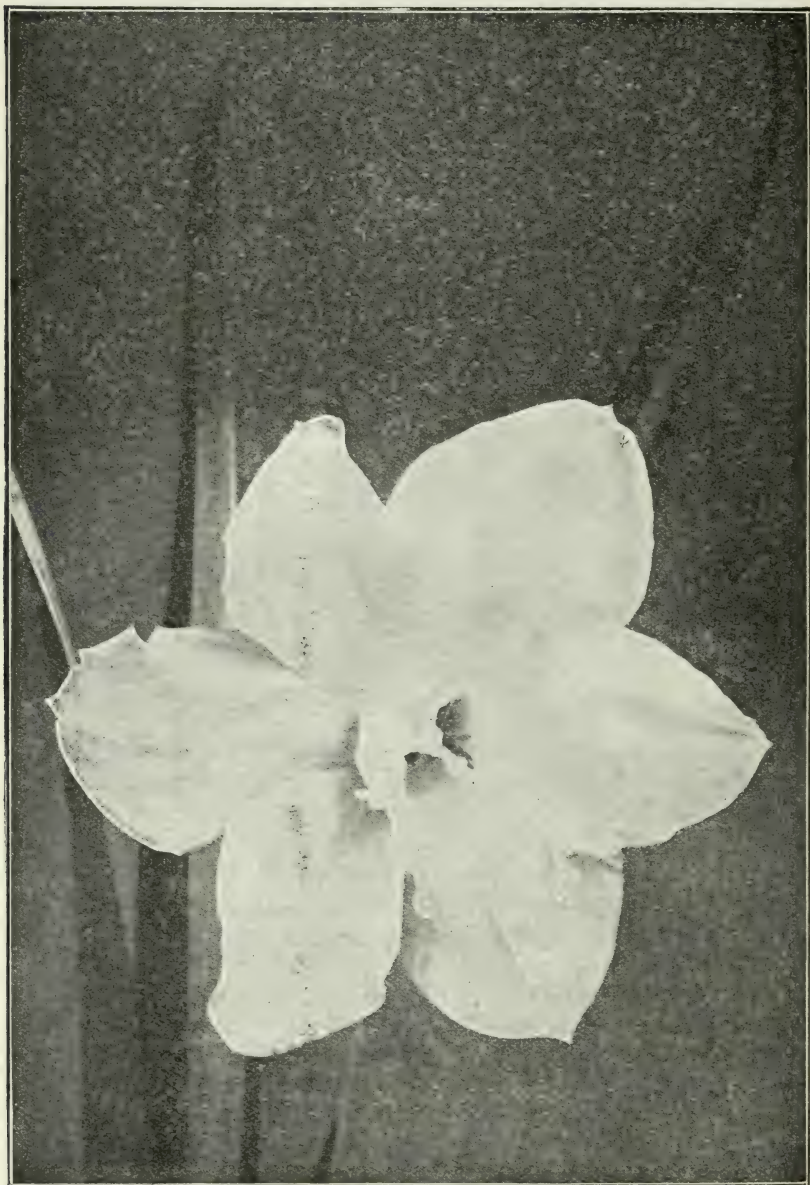


FIG. 17.—NARCISSUS 'LOWDHAM BEAUTY.'

To Messrs. Hogg & Robertson, Mary Street, Dublin, for a group of Tulips and Daffodils.



To Mr. S. Mortimer, Farnham, Surrey, for perpetual-flowering Carnations.

To Messrs. Gunn, Olton, for alpine plants and flowering shrubs.

To Messrs. W. H. Simpson, Birmingham, for a group of Daffodils.

To Mr. H. N. Ellison, Bull Street, West Bromwich, for a group of ferns.

*Special Commendation.*

To Messrs. Walter T. Ware, Inglescombe, Bath, for bunches of 'Queen of the West' and 'Great Warley' Daffodils.

### SPECIAL CLASSES AT THE EXHIBITIONS IN 1909.

[THE FRUIT AND VEGETABLE COMPETITIONS ARE HELD IN PLACE  
OF THE GREAT AUTUMN SHOW.]

TUESDAY, JANUARY 12.

Class 3.—Late Grapes, 3 varieties, 2 bunches of each. Amateurs.  
First Prize, £3; Second, £2.

No entries.

Class 4.—Two bunches of one Black Grape. Amateurs.  
First Prize, £1; Second, 15s.

1. Sir Walpole Greenwell, Bart., Marden Park, Woldingham  
(gr. W. Lintott).

Class 5.—Two bunches of one White Grape. Amateurs.  
First Prize, £1; Second, 15s.

No entries.

Class 6.—Two Baby baskets, one of one Black, one of one White  
Grape. Trade Growers.

First Prize, Silver Knightian Medal; Second, Silver Banksian Medal.

No entries.

Class 7.—One Baby basket of one Grape. Judged for flavour. Trade  
Growers.

First Prize, Silver Knightian Medal; Second, Silver Banksian Medal.

No entries.

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TUESDAY, JANUARY 26.

Class 3.—Sea Kale, 2 Dishes. Amateurs.

First Prize, 15s.; Second, 10s.

1. Mrs. Trotter, Dyrham Park, Barnet (gr. H. Juniper).
2. Lord Foley, Ruxley Lodge, Claygate, Surrey (gr. H. C.  
Gardner).

Class 4.—Rhubarb, two varieties: 12 stalks of each. Amateurs.

First Prize, 15s.; Second, 10s.

1. Mrs. Trotter.

Class 5.—Rhubarb, twelve stalks of any one variety. Amateurs.

First Prize, 10s.; Second, 7s. 6d.

No entries.

Class 6.—Asparagus, one bundle. Amateurs.

First Prize, 15s.; Second, 10s.

No entries.

Class 7.—Salads, four varieties, home-grown. Amateurs.

First Prize, 15s. ; Second, 10s.

1. Hon. Vicary Gibbs, Aldenham House, Elstree, Herts (gr. E. Beckett).

Class 8.—Lettuce, 6 heads of Lettuce and 6 of Endive. Amateurs.

First Prize, 15s. ; Second, 10s.

No entries.

Class 9.—Forced Vegetables, 4 kinds to occupy a space 3 × 3. Trade Growers.

First Prize, Silver Knightian Medal ; Second, Silver Banksian Medal.

No entries.

#### TUESDAY, FEBRUARY 9.

Class 3.—Dessert Pears, 4 dishes, distinct. Amateurs.

First Prize, £1 ; Second, 15s.

No entries.

Class 4.—1 dish. Amateurs.

First Prize, 7s. 6d. ; Second, 5s.

1. Lord Foley.
2. Mary, Countess of Ilchester, Holland House, Kensington (gr. C. Dixon).

Class 5.—Not exceeding 6 dishes, distinct. Trade Growers.

First Prize, Silver Knightian Medal ; Second, Silver Banksian Medal.

No entries.

Class 6.—1 dish. Trade Growers.

First Prize, Silver Banksian Medal ; Second, Bronze Banksian Medal.

No entries.

#### TUESDAY, FEBRUARY 23.

Class 3.—Dessert Apples, 4 dishes, distinct. Amateurs.

First Prize, £1 ; Second, 15s.

1. Viscount Enfield, Wrotham Park, Barnet (gr. H. Markham).
2. Col. Borton, Cheveney, Hunton, Kent (gr. J. Whittle).

Class 4.—1 dish. Amateurs.

First Prize, 7s. 6d. ; Second, 5s.

1. Sir Edmund Loder, Maplehurst, Horsham (gr. J. Watkin).
2. H. G. Wadlow, Esq., Marylands, Dogsthorpe, Peterborough.

Class 5.—6 dishes, distinct. Trade Growers.

First Prize, Silver Knightian Medal ; Second, Silver Banksian Medal.

1. Messrs. James Veitch, Chelsea, S.W.
2. Messrs. W. Seabrook, Chelmsford.

Class 6.—1 dish. Trade Growers.

First Prize, Silver Banksian Medal ; Second, Bronze Banksian Medal

No entries.



## TUESDAY, MARCH 9.

Special Exhibition of Forced Spring Bulbs was held. The object was to demonstrate the varieties best suited for forcing, and exhibits of small and large collections were invited from Amateurs and the Trade. R.H.S. Medals were awarded according to merit.

HYACINTHS, TULIPS, AND DAFFODILS. — The Council also offered, subject to the General Rules of the Society, the following Prizes presented by the Dutch Bulb Growers' Society at Haarlem :—

## DIVISION I.

## For Amateurs.

REGULATIONS.—For Classes 3 and 4, each bulb must be in a separate pot (size optional). Classes 3, 4, and 5, must be all single spikes; no spikes may be tied together. Exhibitors in Class 3 may not compete in Class 4; and all the bulbs must have been forced entirely in Great Britain or Ireland.

## Class 3.—19 Hyacinths, distinct.

First Prize, £6 6s.; Second, £5 5s.; Third, £4 4s.; Fourth, £3 3s.;  
Fifth, £2 2s.; Sixth, £1 1s.

1. Hon. Vicary Gibbs.
2. L. Noblett, Esq., Monkswell, Wavertree, Liverpool (gr. T. Bushell).
3. The Duke of Portland, Welbeck Abbey, Worksop (gr. J. Gibson).
4. H. S. Bartleet, Esq., Severndroog, Shooters Hill, Kent.
5. The Marquess of Salisbury, Hatfield House, Hatfield, Herts (gr. H. Prime).
6. A. G. Gentle, Esq., Little Gaddesden, Berkhamsted, Herts.

## Class 4.—12 Hyacinths, distinct.

First Prize, £5 5s.; Second, £4 4s.; Third, £3 3s.; Fourth, £2 2s.;  
Fifth, £1 1s.

1. A. Earle, Esq., Childwall Lodge, Wavertree, Liverpool (gr. T. Hitchman).
2. F. Stewart, Esq., Jesmond, Wavertree, Liverpool.
3. Lord Howard de Walden, Audley End, Saffron Walden (gr. J. Vert).
4. E. Mocatta, Esq., Woburn Place, Addleston (gr. T. Stevenson).
5. Mr. G. Dyke, The Gardens, Garston Manor, Watford.

Class 5.—4 pans containing Hyacinths, 10 roots of one variety in each pan. The blooms of each pan to be of distinctly different colour from those of the other three pans.

First Prize, £4 4s.; Second, £3 3s.; Third, £2 2s.; Fourth, £1 1s.

1. The Duke of Portland.
2. Hon. Vicary Gibbs.
3. Lord Howard de Walden, Audley End, Saffron Walden (gr. J. Vert).
4. The Marquess of Northampton, Castle Ashby, Northampton (gr. A. R. Searle).

## DIVISION 2.

## For Trade Growers.

Class 6.—Collection of Hyacinths, in pots, pans, or glasses.  
Prize, The Gold Medal of the Dutch Bulb Growers' Society at Haarlem.

1. Messrs. Cuthbert, Southgate, N.

Subject to the General Rules of the Society the Council offered the following prizes presented by Mr. Robert Sydenham :—

Classes 7, 8, 9,—*Bulbs grown in moss fibre or similar material (not earth) and without drainage.*

Class 7.—6 single Hyacinths, in separate vases, not exceeding 6 inches in diameter, to be selected from any of the following varieties ; Balfour, General Vetter, Grand Lilas, Grand Maitre, Innocence, Isabella, Jacques, Johan, Koh-i-Noor, King of the Blues, La Grande-se, and Roi des Belges.

First Prize, 25s. ; Second, 21s. ; Third, 15s. ; Fourth, 10s. ;

Fifth, 7s. 6d.

1. Hon. Mrs. Guy Baring, 16 Cadogan Sq., S.W.
2. Miss C. A. Michell, Oakfield, Cricklewood, N.W.
3. R. Holmes, Esq. Tuckswood, Norwich.
4. Lady Tate, Park Hill, Streatham Common (gr. W. Howe).
5. Mrs. F. Murray, 25 Westbourne Gardens, W.

Class 8.—6 vases of Tulips (vases not exceeding 7 inches in diameter), no restriction as to the number of bulbs in a vase, to be selected from the following ; Duchesse de Parma, Dusart, Fabiola, Joost van Vondel, Keizerskroon, Mon Tresor, Prince of Austria, Rose Gris de Lin, Thomas Moore, Van der Neer, Vermilion Brilliant, White Pottebakker.

First Prize, £1 5s. ; Second, 21s. ; Third, 15s. ; Fourth, 10s. ;

Fifth, 7s. 6d.

1. Hon. Mrs. Guy Baring.
2. Lady Tate.
3. Mrs. Buxton, Fox Warren, Cobham, Surrey (gr. J. R. Hall).
4. R. Holmes, Esq.

Class 9.—6 vases of Narcissi (vases not exceeding 7 inches in diameter), no restriction as to the number of bulbs in a vase, to be selected from the following : Barri Conspicuous, Campernelle, Rugulosus, C. J. Backhouse, Emperor, Frank Miles, Lulworth, Leonie, Mad. de Graaff, Phyllis, Sir Watkin, Victoria, Waterwitch.

First Prize, £1 5s. ; Second, £1 1s. ; Third, 15s. ; Fourth, 10s. ;

Fifth, 7s. 6d.

1. Lady Tate.
2. R. Holmes, Esq.

Class 10.—Cooking Apples, 4 dishes, distinct. Amateurs.

First Prize, £1 ; Second, 15s.

1. Sir Mark W. Collet, Bart., St. Clere, Kemsing, Sevenoaks, Kent (gr. M. Nicholls).
2. Viscount Enfield.

Class 11.—Cooking Apples, 1 dish. Amateurs.

First Prize, 7s. 6d. ; Second, 5s.

1. Col. Borton.

2. Hon. Vicary Gibbs.

Class 12.—Cooking Apples, 8 dishes, distinct. Trade Growers.

First Prize, Silver Knightian Medal ; Second, Silver Banksian Medal.

1. Messrs. James Veitch, Chelsea, S.W.

Class 13.—Cooking Apples, 1 dish. Trade Growers.

First Prize, Silver Banksian Medal ; Second, Bronze Banksian Medal.

No entries.

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TUESDAY, MARCH 23.

Class 3.—Forced Vegetables, 6 kinds. Amateurs.

First Prize, £2 ; Second, £1 10s.

1. Hon. Vicary Gibbs.

Class 4.—3 kinds. Amateurs.

First Prize, £1 ; Second, 15s.

No entries.

Class 5.—6 kinds. Trade Growers.

First Prize, Silver Knightian Medal ; Second, Silver Banksian Medal.

No entries.

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TUESDAY, APRIL 6.

Class 3.—Salads, 6 kinds ; two varieties of a kind may be shown.

See 1909 Code, Rules for Judging. § 81 p. 20.

First Prize, £1 10s. ; Second, £1.

1. Hon. Vicary Gibbs.

Class 4.—1 basket. Amateurs.

First Prize, 15s. ; Second, 10s.

No entries.

Class 5.—6 kinds ; two varieties of a kind may be shown. Trade Growers.

First Prize, Silver Knightian Medal ; Second, Silver Banksian Medal.

No entries.

Class 6.—1 basket. Trade Growers.

First Prize, Silver Banksian Medal. Second, Bronze Banksian Medal.

No entries.

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TUESDAY, APRIL 6.

Class 7.—The Council have accepted from the Trustees of the Veitch Memorial a Medal and £5 as a prize for the best group of Winter-Flowering Carnations (either in pots or as cut flowers, or a combination of



both) staged by an amateur and grown by the exhibitor, and occupying a space of 100 square feet.

1. E. J. Johnstone, Esq., Burrswood, Groombridge (gr. A. T. Paskett).

#### TUESDAY, APRIL 20.

Class 3.—Asparagus, 1 bundle of 100 heads. Amateurs.

First Prize, 10s. ; Second, 7s. 6d.

No entries.

Class 4.—2 bundles of 100 each. Trade Growers.

First Prize, Silver Knightian Medal ; Second, Silver Banksian Medal.

1. Mr. John Poupart, 'Dovers,' Rainham, Essex.

Class 5.—French beans, dwarf or climbing, 2 dishes, distinct. Amateurs.

First Prize, 10s. ; Second, 7s. 6d.

1. Hon. Vicary Gibbs.

Class 6.—Broccoli, 2 dishes, distinct. Amateurs.

First Prize, 15s. ; Second, 10s.

No awards.

Class 7.—3 dishes, distinct. Trade Growers.

First Prize, Silver Knightian Medal ; Second, Silver Banksian Medal.

No entries.

#### TUESDAY, APRIL 20.

Class 8.—Daffodils: Messrs. Barr and Sons have presented to the Society a Silver Cup, valued at £7 7s., as a prize for a group of Daffodil blossoms grown entirely out-doors, Polyanthus excluded, Doubles optional, but must include some of each of the other sections, and must contain at least thirty varieties distinct ; at least three blooms of each must be shown. Not more than nine blooms of any one variety may be put up. To be staged in bottles, vases, or tubes not exceeding 3 inches in diameter at the top (inside measurement), and all the stems must touch the water. Quality of flower will count more than quantity, and correct naming and tasteful arrangement will be duly considered. Any hardy foliage may be used, Daffodil or otherwise. No prize will be awarded unless there are three competitors at least. Open to amateurs and gentlemen's gardeners only.

First Prize, The Cup ; Second, Silver Flora Medal.

Past winners of this Cup may exhibit, but will not be eligible to receive the Cup more than once in three years. In the event of any such previous winner being adjudged 'first,' a medal will be awarded instead of the Cup, which will go to the next best exhibit, provided that the judges consider it to be of sufficient merit.

No entries.

## SCIENTIFIC COMMITTEE.

JANUARY 12, 1909.

Mr. E. A. BOWLES, M.A., F.L.S., in the Chair, and twelve members present.

*Richardia diseased*.—A large spathe of *R. ethiopica* was exhibited having about half the outer part brown and dead. Similar brown spots had appeared upon the leaves. No fungus was present, and the Committee thought that, in all probability, the trouble was due to overfeeding.

*Malformed Orchid*.—From Mr. Lynch, V.M.H., of Cambridge Botanic Garden, came a malformed flower of *Cypripedium Dominionum*, with a normal flower for comparison. The flower had the sepals fused and a double lip.

*Diseased Carnations*.—Specimens of diseased Carnations were received from Natal, where a very large number of plants had suffered at all stages. These were referred to Mr. Saunders and other members of the Committee for further investigation.

*Nomenclature of multigeneric Orchid hybrids*.—The Chairman announced that the sub-committee appointed to consider this question had arrived at the decision that the best solution of the question lay in coining names for each of the combinations of genera made, consisting of a commemorative name and the termination "ara." The full text of their finding will be laid before the Committee at an early date.

*Parasitic Rose canker*.—Mr. Chittenden, F.L.S., showed specimens of the Rose canker described in the JOURNAL R.H.S., Vol. xxxiv., p. 222. The Roses attacked had been imported from Germany three years ago.

## SCIENTIFIC COMMITTEE, JANUARY 26, 1909.

Mr. E. A. Bowles, M.A., F.L.S., in the Chair, and eight members present.

*Diseased Carnations*.—Mr. Saunders, F.L.S., and Mr. Douglas, V.M.H., reported that the diseased Carnations shown at the last meeting, had in all probability died through attacks of stem eelworm. The soil used for potting was too light, and the plants were too old to yield the best results. Plants of two years of age were sometimes liable to sudden collapse, and those of a greater age even more liable to fail in this manner.

*Grease bands*.—Mr. W. Voss reported that no moths had been caught upon grease bands on fruit trees at Enfield since November.

*Algae, &c., on sewage sludge*.—Dr. Voelcker remarked that mosses, hepatics, and algae had developed upon certain samples of sewage sludge which had been kept at Woburn, but not upon others, which were kept under precisely the same conditions. The samples which contained the greatest amount of lime bore the largest amount and greatest diversity of growth, and it was thought that possibly the difference was as much due to the physical condition of the sludge as to its chemical constitution.

*Scilla*, &c.—Mr. Worsley showed an inflorescence of *Scilla haemorrhoidalis*, a plant with rather inconspicuous flowers followed by larger, fleshy fruits. He also remarked upon the inconstancy of the arrangement of the spines in certain of the Cacti in various stages and at different ages, and stated that, in his opinion, the arrangement of the spines constituted an insecure basis for the classification of this family.

*Fasciation*.—From Sir Trevor Lawrence, Bart., came a fasciated specimen of *Anthurium* bearing two spathes and spadices. Mr. E. H. Jenkins sent a fasciated specimen of *Daphne japonica*.

*Cattleya Trianaei malformed*.—A flower of *Cattleya Trianaei* having three stamens and a much reduced perianth was received from Mr. Gurney Wilson, and referred to Mr. Saunders for further examination.

*Varieties of foliage of Cyclamen*.—Mr. Bowles showed a large number of leaves of *Cyclamen hederacifolium* from his garden, exhibiting great and wide variation in the arrangement of the markings upon the foliage, especially in the extent of the whitish margin and median blotch which is usually present. He found the variations to be characteristic of, and retained by, the individual plants.

#### SCIENTIFIC COMMITTEE, FEBRUARY, 9, 1909.

Mr. E. A. Bowles, M.A., F.L.S., F.E.S., in the Chair, and nine members present, and Mr. Gurney Wilson visitor.

*Malformed Orchids*.—Mr. Saunders, F.L.S., reported that the flower of *Cattleya Trianaei* referred to him from the last meeting showed three perfect stamens surrounding the pistil, three very short and regular petals, and three sepals shorter still. Mr. Saunders showed drawings illustrating these points.

*Albinism in Orchids*.—Mr. Gurney Wilson exhibited specimens in illustration of the inheritance of albinism in *Dendrobiums*. He found that *Dendrobium Murhonianum* crossed with *D. Ballianum*, the former not a pure albino, though pale, the latter nearly white, gave seedlings almost exactly like typical *D. nobile*. *D. nobile album* (*virginale*) which, when selfed, gives quite white seedlings, when crossed with *D. Findlayanum* gives *D. "Cybele,"* all the seedlings being alike, and no light forms among them. Similarly, *Dendrobium Wardianum album* crossed with *D. nobile album* gives all coloured flowers. These "reversions" to coloured forms confirm the results that have been obtained in crossing Sweet Peas and Stocks.

*Floral proliferation in Cyclamen*.—Mr. L. Lawrence (gr. to R. Gregory, Esq., of Shoreham) exhibited a plant of *Cyclamen* showing floral proliferation. The seed was from Lowe's *Cyclamen* "Salmon Queen," and this was the only plant which had produced such flowers. All the flowers on the plant were alike, and every one had five perfect flowers arising from within the calyx, probably axillary to the sepals, though apparently alternating with them, and surrounding the central corolla, &c.

*Hippeastrum pardinum*.—Mr. Worsley exhibited flowers of a form which he regarded as belonging to this species. He considered the species



to be a variable one, and the form figured in the "Botanical Magazine," t. 5645, not to be the one most commonly met with.

*Notonia Grantii*.—This interesting Composite with bright-red heads of flowers and Kalanchoë-like in habit, about 3 feet in height, a native of Uganda, was exhibited by Messrs. J. Veitch. It was recommended that a Botanical Certificate be awarded to it. It is figured in the "Botanical Magazine," t. 7691. (Fig. 18.)

#### SCIENTIFIC COMMITTEE, FEBRUARY 23, 1909.

Mr. E. A. BOWLES, M.A., F.L.S., F.E.S., in the Chair, and eighteen members present.

*Diseased Parsnips*.—A report was received from Mr. Güssow concerning the Parsnips with scabby spots from Mr. Gregory. They were attacked by the fungus *Plasmopara nivea*, which appears first on the leaves. This fungus also attacks Carrots and Parsley.

*Malformations in Orchids*.—Mr. Gurney Wilson, F.L.S., sent the apical portion of a pseudo-bulb of *Dendrobium nobile* bearing a shoot from which roots had grown as in a vegetative shoot, and a flower, the lateral petals of which were coloured like the labellum. He also sent a dimerous flower of *D. nobile* with the lip suppressed and the two lateral sepals coherent. A *Cypripedium* from Sir Jeremiah Colman having two dorsal sepals was also shown.

*Mendelism in Orchids*.—Mr. Rolfe, A.L.S., showed flowers the result of crossing *Epidendrum evectum* and *E. xanthinum*. The former of these is purplish in colour, the latter yellow. The first cross gives *E. × kewense*, and flowers of this hybrid were shown. Seedlings had been raised from *E. × kewense* after self-fertilization, and of these, one which flowered earlier was practically a reproduction of *E. × kewense*, while of two others (flowers of which were shown) one showed partial reversion towards the purple *E. evectum*, the other toward the yellow *E. xanthinum*. He also showed the result of re-crossing *E. × kewense* with the original parent *E. evectum*, the resulting plant having a purple flower not quite so dark as the parent. Mr. Rolfe said that *E. × kewense* re-crossed with *E. xanthinum* gave a yellow flower. Other plants of the crosses had not yet flowered.

*Colour changes in Carrots*.—Dr. Plowright sent the following note concerning the colour changes occurring in Carrots, together with illustrative specimens. The portion of a Carrot sent is interesting as showing the condition common last year, viz. the longitudinal splitting of the root from the crown downwards, exposing the medullary portion, which shows no tendency to cleave. The exposed portion shows a tendency to development of chlorophyll. On the edges of the cortical portion no chlorophyll is seen, but minute specks, tending to become confluent, of a red colouring matter (carotin) have been freely developed. The specimen sent is of an ordinary garden Carrot; the fissuring of the outer portion is thought to be due to dryness at the time of growth. In the smaller specimen different colour changes have taken place. The exterior has freely developed a green tint mottled with patches of purple. The roots



FIG. 18.—NOTONIA GRANTII. (*Gardeners' Chronicle*.) (p. xxxiv.)

have been exposed on the surface of the ground all the winter. The purple is quite superficial. It is interesting to note that this brilliant change has taken place in the least coloured variety, for these small ones are, as a section shows, of the pale variety grown for cattle, and popularly known as "stock Carrots." Incipient colours are often shown in the exposed roots of other plants—for example, blue discoloration—as woad root-stocks are frequently mottled with blue stains when they are pulled and left exposed to the light and air.

*Potato tuber diseased.*—Mr. Massee, V.M.H., showed a Potato tuber having a black patch (dry scab) about 2 inches square, the result of the attack of the fungus *Stemphylium* (*Phellomyces*) *atrovirens*. This disease has been very prevalent in Scotland this season, and considerable damage has been done to the crop. The present example came from Oxford. The spores are known to remain alive in the soil, and capable of infecting Potatos for several years. Diseased tubers should, therefore, not be used for "seed," nor should Potatos be grown on the same land as that on which the diseased crop was grown.

*Apple containing germinating seed.*—Mr. F. J. Baker showed an Apple containing germinating seed, and made some remarks upon the result of allowing seed to dry thoroughly before sowing. He considered that seed of many plants which had been allowed to remain as long as possible within the fruit gave better results than seed removed early and kept for some time before sowing.

*Variation in Primula sinensis.*—Mr. A. W. Sutton, V.M.H., showed a number of plants of *Primula sinensis* having leaves of a shape approaching those of Ivy. He said that occasionally such plants were observed, but they had not until last year set any seed. Seeds had, however, been obtained from three plants last year, and this had given a considerable number of plants with leaves of the form of the parents, and with petals of a very similar form, the form of the latter being apparently correlated with that of the former.

*Cinerarias dying.*—Mr. James sent a plant of *Cineraria*, one of about 150 which had died out of some 3,000. It was found that the base of the plant had been attacked by the bulb mite, *Rhizoglyphus echinopus*, in great numbers, and that these had caused the death of the plant.

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#### SCIENTIFIC COMMITTEE, MARCH 9, 1909.

Mr. E. A. BOWLES, M.A., F.L.S., F.E.S., in the Chair, and twenty members present.

*Beetle in stem of Vanda teres.*—Mr. Saunders, F.L.S., reported that he had examined the stem of *Vanda teres*, and found that the beetle boring into it was a species of *Xyleborus*, not a native, nor, so far as could be ascertained, recorded as occurring in Europe up to this time. The plants attacked were sent by Mr. Rogers from a greenhouse at Bury, Lancs.

*Spots on leaves of Lapageria.*—Mr. Massee, V.M.H., reported that he had examined the leaves of *Lapageria* and found that the roundish brown spots upon them had been caused, not by a fungus, but by a drip.



*Orchid hybrids*.—Mr. Chapman showed *Odontioda Bradshawiae* "Oakwood var.," raised by crossing *Odontoglossum crispum* var. *Graireanum* with *Cochlioda Noezliana*. The flowers showed no trace of blotching, but were almost of one shade of colour throughout. Another form, *Odontioda Bradshawiae* "Cookson's var.," raised from *Odontoglossum crispum*  $\times$  *Cochlioda Noezliana*, had a deep mauve margin to the brick-red segments, and showed distinctly the deeper coloured blotches upon the lighter ground colour. The difference in colour and markings in these two varieties forms an interesting problem in heredity.

"*Vegetable*" *asbestos*.—Mr. Holmes, F.L.S., reported that he had examined this material, and could find no trace of vegetable structure in it. The substance was creamy-white in colour, and was lamellated, fairly soft to the touch, and resisted fire. Chemical analysis showed it to contain alumina in large quantities, magnesium, calcium, and smaller quantities of sodium and silica. Mr. Holmes considered that the analysis pointed to this being of mineral origin, and not of having been derived from a "Cactus from China," as the sender had suggested. It appeared to be nearly allied to the substance known as "mountain leather."

*Bulb on inflorescence*.—Mr. Worsley showed an inflorescence of *Lachenalia tricolor* having a small bulb occupying the position of a terminal bud on the inflorescence.

*Aberrant Orchid*.—From Mr. Miller, of Wisbech, came a specimen of *Cypripedium Pitcherianum* "Williams var.," with a well-formed double lip.

*Fasciation in Euonymus japonicus*.—Mr. Fraser, F.L.S., showed fasciated branches of *Euonymus japonicus*. The fasciation had followed after severe cutting back of the stem. Numerous buds had started in growth from near where the cut had been made, and among them some had produced fasciated shoots.

*Malformation in Tulip*.—Rev. J. Jacob sent a flower of Tulip having on the outer side of the mid-rib of one of the perianth pieces two small horn-like growths. The structure was similar in character to those seen in crested flowers, and was apparently the commencement of a crested growth.

#### SCIENTIFIC COMMITTEE, MARCH 23, 1909.

Mr. E. A. BOWLES, M.A., F.L.S., F.E.S., in the Chair, with thirteen members present, and Messrs. F. W. South and G. Wilson, F.L.S., visitors.

*Roots of Sweet Peas dying*.—Mr. Massee, V.M.H., reported that he had examined the roots of the Sweet Peas sent to the last meeting, and had found that the cortical cells and root hairs were all killed and browned. He thought they were perfectly free from any disease due to insects or fungi, but had probably been injured by some injurious substance in the soil, or by some fertilizer. Possibly peaty soil with Sphagnum had been used, and humic acid had caused the damage.

*Parsnips from wild stock*.—Mr. F. J. Baker showed some roots of Parsnips of the sixth generation from the wild plants. The roots were of good size, although grown on poor land, and had lost the greater part

of the tough woody fibre of the original stock. In form they showed a near approach to the well-known "Hollow-crown" type of Parsnip. Mr. Baker said there was just a possibility that the plants had in one generation been crossed with pollen from cultivated plants. He found the roots far less liable to rust than the ordinary plants, though they were not entirely free from it.

*Orchid malformations.*—Mr. Gurney Wilson, F.L.S., showed malformed flowers of *Odontoglossum Harryano-crispum* on behalf of Mr. W. Bolton, of Warrington. There appeared to be no symmetry about the multiplication of parts in these flowers, and Mr. Wilson remarked that, as in the present case, when a portion is removed from an established plant, in the next season it is not very unusual for the older portion to bear malformed flowers, while the portions removed bear normal flowers. He also showed a flower of *Selenipedium caudatum* var. *Lindenii*, from Messrs. Charlesworth. In this variety the labellum is not slipper-shaped as in the type, but is replaced by a very long and tapering petal entirely similar to the two lateral petals; there are also three fertile stamens. The variety was figured by Reichenbach (Lindl. Orchid. 28, 1846), under the name of *Uropedium Lindenii*. The form occurs wild.

*Gummosis in Lemon.*—Mr. Worsley showed a branch of a Lemon with leaves beginning to shrivel, attacked in its lower portion by gummosis, a considerable mass of gum exuding from the stem, and the bark being browned all round for a considerable distance. It was remarked that in some cases gumming of trees had been found to be associated with the presence of a fungus, and often appeared to start at a wound, but in the present case no wound could be discerned. Sir Daniel Morris, V.M.H., said that in Florida the gumming usually occurred in the trees where they had been budded, and Mr. Fawcett said he had seen trees affected in a manner similar to that shown by Mr. Worsley's example in the West Indies, where the disease was thought to be associated with too liberal manuring with nitrogenous manures, or with heaping earth around the stems. The disease was treated by cutting out the affected portion and dressing the wound with tar.

*Eucrosia bicolor.*—Mr. Bennett-Poë, V.M.H., showed flowers of this peculiar plant from Miss Willmott's garden. The plant was figured in 1817 in the "Botanical Register," t. 207.

*Grease bands.*—Mr. W. Voss reported that no winter moths of any kind had been caught on the grease bands placed on the fruit trees at Enfield since the end of November.

*Diseased plants.*—Mr. Massee, V.M.H., showed a piece of a Rose stock attacked by the fungus *Leptosphaeria Diplodia*, a well-known fungus on the stems of the Dog Rose and rarely attacking the cultivated varieties. In this case 15,000 bushes had been affected. Mr. Massee also showed shoots of Apple affected by the winter stage of the Apple scab, *Fusicladium dendriticum*. Mr. Massee also showed a branch of Pear which had been damaged by hailstones in the summer. The wounds had healed, and were now free from danger of attack from fungi, but the circular places which had been damaged by the stones had dried, and were sunken and black.



## SCIENTIFIC COMMITTEE, APRIL 6, 1909.

Mr. E. A. BOWLES, M.A., F.L.S., in the Chair, with seventeen members present and Messrs. E. Laxton and J. H. Drummond, F.L.S., visitors.

*Gummosis in Lemon.*—Mr. Güssow reported that the specimens of Lemon shown by Mr. Worsley at the last meeting had been examined microscopically. "After dissolving the gum in warm water, at each of the places where it exuded a wound was to be seen extending some way into the wood. The injured portions had no connection with each other, but were well defined nearly all round the stem. The distance between the two places where gum was seen oozing out was about 4 inches. The bark was peeled off and some of the gum was transferred with a sterilized needle to a cover glass, and was diluted with distilled water. After drying this preparation it was stained for bacteria, and in every case a large number of bacteria were revealed. The presence of the bacteria does not certainly prove that the gumming was caused by them, but the examination plainly showed that the injury could not have been due to some cause or other within the range of the root. Mr. Worsley kindly sent me the root and stem of the diseased Lemon, and the roots were found to be perfectly healthy, with a good many fibres and small rootlets; the stem just above the root showed near a thorn an injury which, according to additional information from Mr. Worsley, had first exhibited the gumming. The specimen examined was a seedling. It is frequently the case that bacteria gain entrance in the place of grafting, and cause profuse outflow of gum in all kinds of stone fruits. A pure culture of the organisms has been made, and it will be used in infecting a young Cherry tree. The bacteria isolated from Cherries, Plums, and Peaches which showed gumming bore great resemblance to those isolated from the Lemon. The withering and flagging, and the silvery appearance of the shoots and leaves above the place of injury are certainly the natural results of the sap-conducting vessels being clogged by the gum."

*Inheritance of character in Pea seeds.*—Mr. A. W. Sutton, V.M.H., exhibited a long series of preparations showing the seeds of plants raised by crossing a Pea which he found growing wild in Palestine (? *Pisum arvense*) with forms of the cultivated garden Pea (*Pisum sativum*), and, with bicolor-flowered Peas (*Pisum arvense*), &c. Twenty-two crosses were made in 1907, and four of these failed to produce mature seed in  $F_1$ ; four died off before flowering in  $F_1$ ; seven flowered but produced no seeds; seven only produced any seeds in  $F_2$  (the latter were shown on cards 1 to 7). In most cases it would appear that the plants were almost or quite sterile. On cards 8, 9, and 10 were the results of crosses made between the Palestine Pea and *Pisum sativum* by Mr. Darbishire, and grown at Reading. They practically confirm Mr. Sutton's experiments. Mr. Sutton also exhibited a growing plant of the wild Pea from Palestine, and a plant of *Pisum quadratum* (?) grown from seeds received from Kew. This plant much resembles the Palestine Pea in all respects except the foliage. He also exhibited a collection of the various forms of seeds of the garden Pea (*Pisum sativum*), and of bicolor blooming types



(*Pisum arvense*), &c. Among the remaining cards, some which showed that when Improved William 1st, with semi-wrinkled seeds, is crossed with a wrinkled Pea, the resulting types of seed do not follow the Mendelian ratio of 3 : 1, were particularly interesting. This Pea contains starch grains of similar form to those which are found in round seeds, and not of the form found in wrinkled seeds, so that unless the wrinkled character of the seed were unconnected with the form of the starch grains the usual Mendelian ratio could scarcely be expected. Mr. J. H. Drummond contributed a series of specimens from his own herbarium and from the herbarium of the Royal Botanic Gardens, by the courtesy of the Director, showing that the plant Mr. Sutton had collected in Palestine was in all probability *Pisum humile* of Bossier, and not *Pisum sativum* or *P. arvense*.

*Wild species of Asparagus and Rhubarb*.—Mr. Sutton also exhibited plants of Asparagus, probably *Asparagus filicinus*, and Rhubarb, apparently *Rheum Moorcroftianum*, sent him from the Punjab by a correspondent. The roots of the Asparagus were tuberous, and were no doubt organs in which water was stored. The young leaves of the *Rheum* were cup-shaped, the leaf-stalk springing from the base of the cup.

*Hippeastrum hybrid*.—Mr. Worsley showed a flower of a deep dragon's blood red, a first cross between the two species *Hippeastrum aulicum* and *H. vittatum*. The flower is of very good form and splendid colour.

*Polystichum sp.*—Mr. Fraser, F.L.S., showed specimens demonstrating the resemblance between *Polystichum lobatum*, Presl., and *P. Lonchitis*, Roth. If the pinnæ of the latter were lobed or lobulate instead of being merely serrated, the two forms would be closely similar, judging from the size and form of the pinnæ in the two cases. The likeness between *Polystichum lobatum*, Presl., and *P. aculeatum*, Sw., was less obvious.

*Seed from S. Africa*.—Mr. Holmes, F.L.S., reported that the seed exhibited by Mr. Veitch was *Voandzeia subterranea*, often called Bambarra ground nut, and used in tropical and South Africa as food.

*Malformed Orchids, &c.*—Mr. Odell showed some malformed Orchids, and some flowers of *Auricula* wherein the filaments of the stamens were becoming transformed into petals, thus showing the beginning of a double flower.

*Dendrobium hybrids*.—R. G. Thwaites, Esq., Streatham, sent flowers of *Dendrobium Thwaitesiae* × *D. Wiganiae xanthochilum* and *D. Wiganiae* × *D. Wiganiae xanthochilum*, both being white with a zone of purple on the disc of the lip. He wrote: "Of the first cross three have flowered like those sent, and of the second six plants have flowered. You will notice the pollen caps and stems are also white. I feel sure it would be quite useless to use those flowers for obtaining white hybrids, and it may be that the unsuccessful attempts to obtain white flowers (hybrids from apparently white parents) is due to coloured parentage somewhere behind the flowers used. These and other results, though apparently confusing, may later on assist in throwing light upon the question of albinism, as, notwithstanding the contradictions which are appearing, I feel sure there is some logical law relating to it." *D. Wiganiae* is a hybrid between *D. nobile* and *D. signatum*, *D. Wiganiae xanthochilum* being a seedling out of the same pod, while *D. Thwaitesiae*

represents the result of further crossing *D. Wiganiae* and *D. Ainsworthii* (*nobile*  $\times$  *aureum*). The original parents are therefore either purple or yellow flowers, and the cause of the peculiarity is not apparent.

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## SCIENTIFIC COMMITTEE, APRIL 20, 1909.

Mr. E. A. BOWLES, M.A., F.L.S., F.E.S., in the Chair, and thirteen members present.

*Fatsia injured by gnawing animals.*—Mr. Odell reported that he had examined the plants of *Fatsia* in the garden of Mr. Kingsmill, at Harrow Weald, who had sent specimens of the injured stems to be examined by the Committee, and found that the injury had been caused by the long-tailed field mouse, which had gnawed off the bark of some of the branches all round for a considerable length.

*Double Auricula.*—Mr. Druery, V.M.H., called attention to a double-flowered Auricula of an exceedingly dark purple colour, shown by Mr. J. Douglas, V.M.H. The plant had been raised by Mr. C. B. Green, of Acton, from seed bought of Mr. Douglas. The example was particularly interesting, since Mr. Douglas stated that never before in his experience had a double Auricula been raised from seed of his plants. Sir Daniel Morris, V.M.H., raised the question of whether such a variation as this suddenly occurring from seed could rightly be called a sport. The discussion of the proper application of this term was deferred.

*Various plants.*—Mr. Worsley showed flowers of Tulips which he had received under the name of *Tulipa Fosteriana* from Holland, and commented upon the amount of variation in colour which these showed, especially in the presence and absence of the dark blotch at the base of the perianth segments. He considered that the plant approached very closely to *Tulipa Eichleri*. Mr. Worsley also offered some remarks upon a plant which he had identified as *Urceolina miniata*, a native of the Peruvian Andes.

From Mr. A. W. Sutton, V.M.H., came an unnamed Composite, apparently a native of Tropical Africa. In appearance the flowers somewhat resembled those of a Cineraria, but did not seem identical with any known species. Mr. Sutton was asked to show the plant again when ripe fruit could also be seen.

Sir Daniel Morris, V.M.H., remarked that he had recently seen, in a garden in the New Forest, a white-flowered shrub about 5 feet or 6 feet in height, which there passed under the name of *Leucopogon Cunninghamii*, but which was really *Spiraea Thunbergii*. He desired to know whether *Leucopogon Cunninghamii* was hardy in England.

*Presentation to the Library.*—Professor A. H. Church, F.R.S., presented three books which he had had privately printed, being catalogues of some 6,000 manuscripts, scarce pamphlets, &c., contained in the library of the Royal Society, and dating from about 1606 to the beginning of the nineteenth century, containing many interesting references to well-known botanists and other scientific men of this and foreign countries to which

Professor Church briefly referred. Professor Church was heartily thanked for these interesting additions to the library.

*Malformed Orchids.*—Mr. Gurney Wilson, F.L.S., sent two malformed *Cattleyas* from the same spike, which had three outer perianth pieces, but the inner were very greatly reduced, the small lip springing from near the apex of the column instead of from the base. Three stamens were present.



## FRUIT AND VEGETABLE COMMITTEE.

JANUARY 12, 1909.

Mr. GEO. BUNYARD, V.M.H., in the Chair, and twenty-five members present.

### Awards Recommended :—

*Silver Banksian Medal.*

To University College, Reading (gr. Mr. C. Foster), for Tomatos, Lettuces and Carrots.

*First Class Certificate.*

To Pear 'Blickling' (votes, 13 for, 5 against), from Col. the Hon. C. Harboard, Gunton Park, Norwich (gr. Mr. Allen). A January dessert variety which received A.M. January 8, 1907. See Journal, vol. xxxiii. p. lxiii.

### Other Exhibits.

Miss Bullen, Awbridge House, near Romsey : Apple 'Kelsey.'

Mr. W. Camm, Cliveden Gardens, Taplow : seedling Apples.

Mr. T. Carter, Butleigh Court Gardens, Glastonbury : Apples.

Mr. A. Dean, Kingston : Apple 'Belle de Boskoop,' A.M. 1897.

Lord Hillingdon, Hillingdon Court : Pear 'Duchesse de Bordeaux.'

Mary, Countess of Ilchester, Holland House : seedling Apple.

Rev. Rollo Meyer, Clophill, Ampthill : Apple 'Grandfather's Secret.'

Mr. H. T. Pewtress, Tillington Nurseries, Hereford : seedling Apple.

Messrs. W. B. Rowe, Barbourne Nurseries, Worcester : seedling Apple.

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FRUIT AND VEGETABLE COMMITTEE, JANUARY 26, 1909.

Mr. G. BUNYARD, V.M.H., in the Chair, and eighteen members present.

### Awards Recommended :—

*Silver-gilt Banksian Medal.*

To Mrs. Denison, Little Gaddesden (gr. Mr. A. G. Gentle), for vegetables.

*Silver Knightian Medal.*

To Messrs. Cheal, Crawley, for Apples.

*Silver Banksian Medal.*

To University College, Reading (gr. Mr. C. Foster), for forced vegetables.

### Other Exhibits.

Hon. A. H. T. de Montmorency, Carrickmines, Ireland : seedling Potatos.

FRUIT AND VEGETABLE COMMITTEE, FEBRUARY 9, 1909.

Mr. G. BUNYARD, V.M.H., in the Chair, and twenty-three members present.

**Awards Recommended :—**

*Gold Medal.*

To Messrs. Bunyard, Maidstone, for Apples.

*Silver Knightian Medal.*

To Messrs. Carter, High Holborn, for Potatos.

*Silver Banksian Medal.*

To University College, Reading (gr. Mr. Foster), for forced vegetables.

*Cultural Commendation.*

To Mr. J. B. Allen, Osberton Gardens, Worksop, for pods of Vanilla.

To Messrs. Carter Page, London Wall, for forced Seakale.

**Other Exhibits.**

Colonel Brymer, Dorchester : Pear 'Bergamotte d'Esperen.'

Miss Bullen, Awbridge House, near Romsey : Apple 'Kelsey.'

Mary, Countess of Ilchester, Holland House : Pears.

Mr. F. Paget Norbury, Malvern : Apple 'Jonathan.'

Mr. E. H. Prior, Wisbech : Apples.

Messrs. Redshaw, Bourne, Lincs : Apples.

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FRUIT AND VEGETABLE COMMITTEE, FEBRUARY 23, 1909.

Mr. J. CHEAL in the Chair, and fourteen members present.

**Awards Recommended :—**

*Silver-gilt Knightian Medal.*

To Mr. Poupart, Jnr., Twickenham, for bottled fruit.

To Messrs. Rivers, Sawbridgeworth, for Oranges.

*Silver Knightian Medal.*

To Messrs. Seabrook, Chelmsford, for Apples.

To O. P. Serocold, Esq., Taplow, for Apples.

*Silver Banksian Medal.*

To Mrs. Sophia Miller, Marlow, for Orange Jelly and Chutney.

*First-class Certificate.*

To Apple 'Barnack Beauty' (votes, unanimous), from Mr. A. Poupart, Twickenham. This variety received an Award of Merit as a market variety on March 14, 1899, and is described in the R.H.S. JOURNAL, vol. xxiii. pp. xxxvii, xxxviii. (Fig. 19.)

*Cultural Commendation.*

To Mr. A. Poupart, Twickenham, for Seakale.

**Other Exhibits.**

C. Coombe, Esq., Cobham : a Citron fruit.

Rt. Hon. Lord Hillingdon, Uxbridge : Apple 'McIndoe's Russet.'

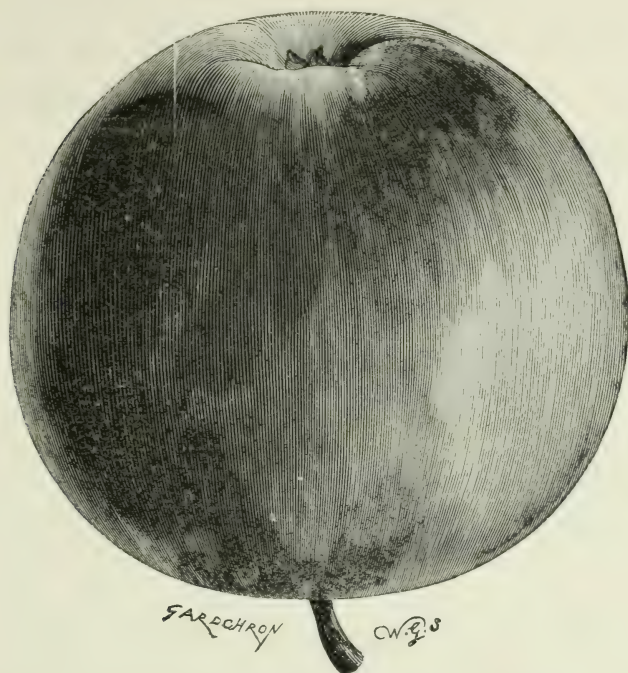


FIG. 19.—APPLE 'BARNACK BEAUTY.' (*Gardeners' Chronicle*.) (p. xlv.)

## FRUIT AND VEGETABLE COMMITTEE, MARCH 9, 1909.

Mr. G. BUNYARD, V.M.H., in the Chair, and twenty-one members present.

**Awards Recommended :—***Silver Banksian Medal.*

To the Hon. Vicary Gibbs, Elstree, for bulbs of Onion 'Ailsa Craig.'

To P. Nelke, Esq., Virginia Water, for seven dishes of Apples.

To Messrs. Sutton, Reading, for Lettuces and Radishes.

**Other Exhibits.**

E. Lane, Esq., Kentchurch Court, Hereford : seedling Apple.

Sir Edmund Loder, Bart., Horsham : Apples 'St. Leonards Seedling,' 'Traveller,' 'Bassam,' 'Radford Beauty,' 'Grange's Pearmain.'

Sir Ernest Paget, Bart., Loughborough : Apples 'Umbrella' and 'Baddon Pippin.'



T. Sharpe, Esq., Westbury, Wilts ; seedling Apple 'Burcombe.'

Messrs. R. Veitch, Exeter ; Apples 'Claygate Pearmain,' 'Belle de Pontoise,' and 'Boston Russet.'

Messrs. J. Veitch, Chelsea : an Apple for naming.

Messrs. Wood, Wood Green, N. : 'Copped Hall' grape-storing bottle.

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FRUIT AND VEGETABLE COMMITTEE, MARCH 23, 1909.

Mr. G. BUNYARD, V.M.H., in the Chair, and thirteen members present.

**Awards Recommended :—**

*Silver Knightian Medal.*

To Mr. J. Poupart, Rainham, for Asparagus, &c.

*Bronze Banksian Medal.*

To Miss C. M. Dixon, Chichester, for Strawberries.

*Cultural Commendation.*

To Mr. A. Poupart, Twickenham, for Seakale.

**Other Exhibits.**

MESSRS. G. Fowler Lee, Reading : fruit-bottling appliances.

Mr. J. Garland, Exeter : Apple 'Star of Devon,' Pear 'Uvedale's St. Germain' weighing 2½ lbs.

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FRUIT AND VEGETABLE COMMITTEE, APRIL 6, 1909.

Mr. G. BUNYARD, V.M.H., in the Chair, and twenty members present.

**Awards Recommended :—**

*Silver-gilt Knightian Medal.*

To Messrs. Rivers, Sawbridgeworth, for Oranges.

*Silver Banksian Medal.*

To Lord Monson, Lincoln, for twelve dishes of Apples.

To Messrs. Veitch, Chelsea, for Lettuces, Cucumbers, &c.

*Award of Merit.*

To Rhubarb 'Dawes' Challenge' (votes, unanimous), from Mr. T. E. Dawes, Kings Lynn. An enormous variety, very prolific, with sticks 3 feet 6 inches long and proportionately thick. Bright red, with pink flesh.

*Cultural Commendation.*

To Dr. Newington, Ticehurst, for Apples 'Annie Elizabeth,' 'Prince Albert,' and 'Bramley's Seedling.'

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FRUIT AND VEGETABLE COMMITTEE, APRIL 20, 1909.

Mr. A. H. PEARSON, in the Chair, and nineteen members present.

**Awards Recommended.**

*Silver Banksian Medal.*

To the Countess Cowper, Pangshanger, for Potatos.

To Messrs. Sutton, Reading, for Cabbages.

**Other Exhibits.**

Mr. John Crook, Camberley : Apple 'Sturmer Pippin.'

South African Constantia Fruit Co., 157, Wandsworth Road, Nine  
Elms : Pineapples.

## FLORAL COMMITTEE.

JANUARY 12, 1909.

Mr. W. MARSHALL, V.M.H., in the Chair, and twenty-five members present.

### Awards Recommended:—

#### *Gold Medal.*

To Messrs. Veitch, Chelsea, for stove and greenhouse plants.

#### *Silver-gilt Flora Medal.*

To Messrs. May, Upper Edmonton, for ferns.

To Mr. W. H. Page, Hampton, for Carnations and Lilies.

#### *Silver Flora Medal.*

To Mr. L. R. Russell, Richmond, for Bertolonias, &c.

#### *Silver Banksian Medal.*

To Mr. H. Burnett, Guernsey, for Carnations.

To Messrs. Cutbush, Highgate, for alpinas, &c.

To Messrs. Low, Bush Hill Park, for Carnations, &c.

#### *Award of Merit.*

To *Begonia* 'Patrie' (votes, 13 for, 2 against), from Messrs. Lemoine, Nancy. In general appearance suggestive of *B.* 'Gloire de Lorraine,' with small flowers, almost wholly male, freely and continuously borne as in that variety, but duller in colour, old rose instead of bright pink, and more compact and neat both in general habit and in flower trusses. Derived from *B. socotrana* ♀ × *B. Pearcei* var. ♂. (Fig. 20.)

To Chrysanthemum 'Maud Allan' (votes, 19 for, 3 against), from Mr. N. Molyneux, Rookesbury Park Gardens, Wickham. A late-flowering pure white decorative Japanese variety, with narrow florets. Undisbudded sprays were exhibited to show its good habit and floriferousness.

### Other Exhibits.

Messrs. Barr, Covent Garden: alpinas.

Mr. F. H. Chapman, Rye: Freesias.

Misses Hopkins, Shepperton: alpinas.

Mr. F. Lilley, Guernsey: Chrysanthemum 'New Year Yellow.'

Messrs. Peed, Streatham: alpinas.

A. Sutton, Esq., Reading: *Cyclamen persicum*, collected corms.

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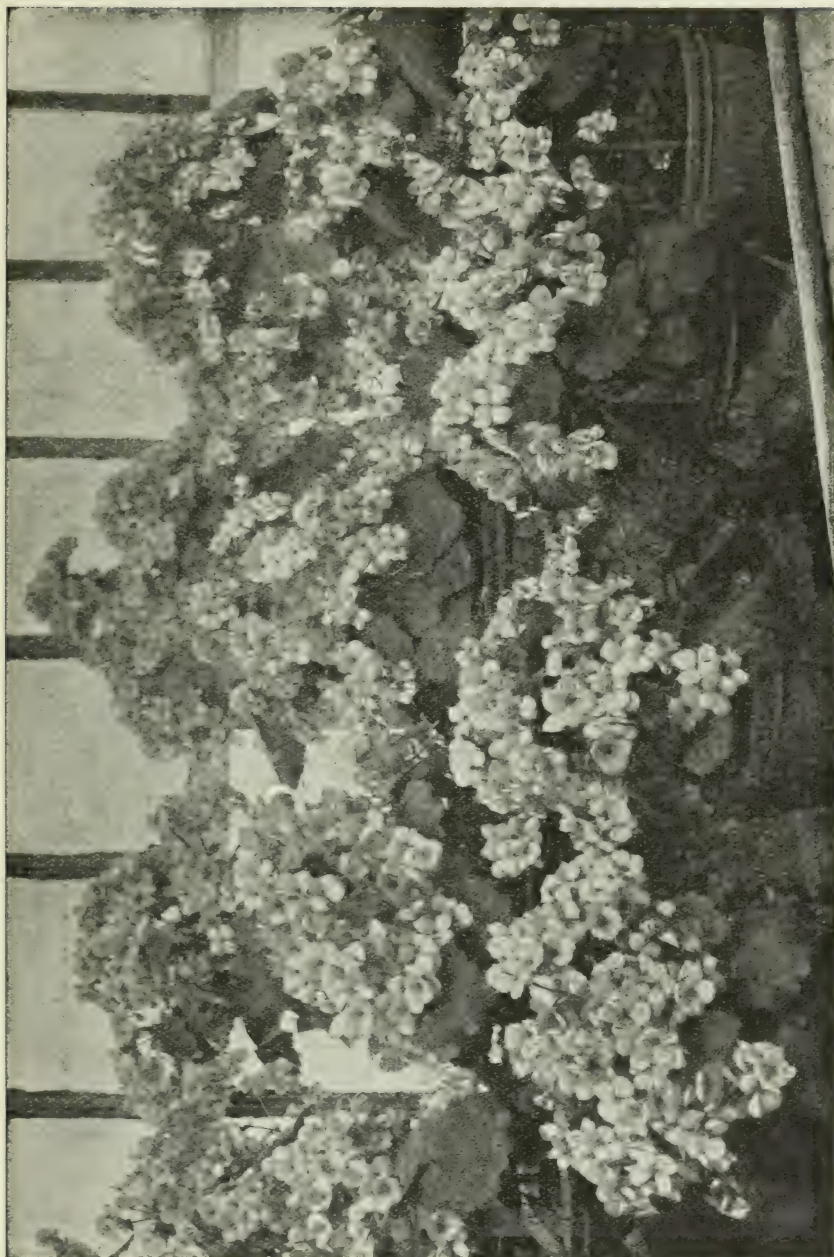


FIG. 20.—*BEGONIA 'PATRIE.'* (*Lemoine.*) (p. xlviii.)

FLORAL COMMITTEE, JANUARY 26, 1909.

Mr. H. B. MAY in the Chair, and eighteen members present.

**Awards Recommended:—**

*Silver-gilt Flora Medal.*

To Messrs. May, Upper Edmonton, for Davallias.

To Mr. W. H. Page, Hampton, for Carnations and Lilies.

To the Marquis of Salisbury, Hatfield House (gr. Mr. Prime), for *Euphorbia jacquiniæflora*.

*Silver Flora Medal.*

To Mr. H. Burnett, Guernsey, for Carnations.

To Messrs. Cutbush, Highgate, for alpinæ, Carnations, &c.

To Messrs. Sutton, Reading, for Cyclamen.

To Messrs. J. Veitch, Chelsea, for greenhouse plants.

*Silver Banksian Medal.*

To Messrs. Low, Bush Hill Park, for Carnations, &c.

To Mr. H. Maude, Wisley School of Horticulture, for floral studies in colour photography, Lumière process.

To Messrs. Peed, Streatham, for alpinæ, &c.

To Mr. L. R. Russell, Richmond, for ornamental shrubs.

*Award of Merit.*

To Chrysanthemum 'Golden Sunset' (votes, unanimous), from Messrs. Robinson and Headey, Dunstable. A bright yellow decorative Japanese variety, with flowers of good substance on stout stalks, and with bright foliage. A sport from 'Victoria,' said to flower three weeks later.

**Other Exhibits.**

Messrs. Barr, Covent Garden: alpinæ, &c.

Mr. F. H. Chapman, Rye: Freesias.

Messrs. Cheal, Crawley: spring flowers.

Misses Hopkins, Shepperton: alpinæ.

Sir Trevor Lawrence, Bart., Burford: Anthuriums.

Mr. G. Reuthe, Keston: alpinæ, &c.

Mr. W. E. Wallace, Eaton Bray: Carnations.

FLORAL COMMITTEE, FEBRUARY 9, 1909.

Mr. W. MARSHALL, V.M.H., in the Chair, and twenty-eight members present.

**Awards Recommended:—**

*Gold Medal.*

To Mr. W. H. Page, Hampton, for Carnations and Lilies.

*Silver-gilt Flora Medal.*

To Messrs. Cuthbert, Southgate, for forced shrubs.

*Silver-gilt Banksian Medal.*

- To Messrs. Cutbush, Highgate, for forced shrubs, Carnations, &c.
- To Mr. Seward, Hanwell, for Cyclamen.
- To Messrs. J. Veitch, Chelsea, for a group.

*Silver Flora Medal.*

- To Mr. H. Burnett, Guernsey, for Carnations.
- To Messrs. Cannell, Eynsford, for Chinese Primulas.
- To Messrs. Sutton, Reading, for Chinese Primulas.

*Silver Banksian Medal.*

- To Messrs. Clark, Dover, for alpinas, &c.
- To Messrs. Low, Bush Hill Park, for Carnations, &c.
- To Messrs. May, Edmonton, for ferns, &c.
- To Messrs. Mount, Canterbury, for Roses.
- To Messrs. Peed, Streatham, for alpinas.
- To Mr. L. R. Russell, Richmond, for shrubs.
- To Messrs. Ware, Feltham, for Primulas.

*Bronze Flora Medal.*

- To Mr. Reuthe, Keston, for rare shrubs, &c.

**Other Exhibits.**

- Messrs. Barr, Covent Garden : spring flowers.
- Messrs. Bath, Wisbech : spring flowers.
- Mr. F. H. Chapman, Rye : Freesias.
- Messrs. Cheal, Crawley : alpinas.
- D. Crocket, Esq., Barcombe, Lewes : a painting.
- Misses Hopkins, Shepperton : alpinas, &c.
- Sir Edmund Loder, Bart., Leonardslee : Sarracenas.
- Mrs. McCreery, Windsor : seedling Carnation.
- Miss Smith, Barnham, Bognor : Primroses, &c.
- Mr. R. Sydenham, Birmingham : Lilies-of-the-Valley.
- Messrs. Wallace, Colchester : Crocuses.

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FLORAL COMMITTEE, FEBRUARY 23, 1909.

Mr. W. MARSHALL, V.M.H., in the Chair, and thirty-one members present.

**Awards Recommended :—**

*Silver-gilt Flora Medal.*

- To Messrs. Cutbush, Highgate, for forced shrubs, Carnations, &c.
- To Messrs. Cuthbert, Southgate, for forced shrubs.
- To Miss Josephine Gundry, Foots Cray, for water-colour studies of flower.
- To Mrs. Leschallas, Windlesham (gr. Mr. Farmer), for *Richardia Elliottiana*.
- To Messrs. Veitch, Chelsea, for Cyclamen, Primulas, Rhododendrons, &c.



*Silver Flora Medal.*

- To Mr. H. Burnett, Guernsey, for Carnations.
- To Messrs. Low, Bush Hill Park, for Carnations, &c.
- To Messrs. May, Edmonton, for ferns and flowers.
- To Mr. W. H. Page, Hampton, for Carnations and Lilies.
- To Mr. L. R. Russell, Richmond, for Lilacs, &c.

*Silver Banksian Medal.*

- To Messrs. Cannell, Eynsford, for Primulas.
- To Messrs. Mount, Canterbury, for Roses.
- To Messrs. Peed, Streatham, for alpiners.
- To Messrs. Ware, Feltham, for alpiners.

*Bronze Banksian Medal.*

- To Mr. G. Reuthe, Keston, for hardy plants.

*Award of Merit.*

To *Freesia* 'Rose Queen' (votes, 20 for), from Messrs. Barr, Covent Garden. Flowers purplish-rose, the white tube marked with a few rose lines; lightly scented. The best in colour and scent of the red varieties yet exhibited.

**Other Exhibits.**

- Messrs. Barr, Covent Garden: flowering bulbs.
- Mr. H. Chapman, Rye: hybrid Cyclamen, &c.
- Messrs. Clark, Dover: rock plants.
- Miss Cox, Rose Hill, Dorking: flower studies.
- Messrs. Eggett, Thames Ditton: ferns.
- Misses Hopkins, Shepperton: rock plants.
- F. W. Moore, Esq., Glasnevin, Dublin: *Lachenalia* 'Outlaw.'
- Miss Smith, Barnham, Bognor: rock plants.
- Mr. R. Sydenham, Birmingham: Lilies-of-the-Valley.
- Mr. A. R. Upton, Guildford: hardy plants.

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FLORAL COMMITTEE, MARCH 9, 1909.

Mr. W. A. BILNEY, J.P., in the Chair, and twenty-four members present.

**Awards Recommended:—**

*Gold Medal.*

- To Sir Everard Hambro, Hayes, Kent, for rock plants.

*Silver-gilt Banksian Medal.*

- To Messrs. Carter, High Holborn, for bulbs.
- To Messrs. Wallace, Colchester, for alpine plants.

*Silver Flora Medal.*

- To Messrs. Cannell, Swanley, for Begonias and Primulas.
- To Messrs. Page, Hampton, for a group of Carnations, Lilies, &c.

To Messrs. Paul, Waltham Cross, for Camellias and ornamental Peaches.

To Mr. L. R. Russell, Richmond, for Azaleas.

*Silver Banksian Medal.*

To Messrs. Bees, Liverpool, for *Primula malacoides*.

To Mr. H. Burnett, Guernsey, for Carnations.

To Messrs. Cutbush, Highgate, for bulbous plants.

To Messrs. Low, Enfield, for Acacias, &c.

To Messrs. May, Upper Edmonton, for Cinerarias, Primulas, &c.

To Messrs. Peed, Streatham, for rock plants, Cacti, &c.

To the Marquis of Salisbury, Hatfield (gr. Mr. Prime), for a group of *Lachenalia Nelsoni*.

To Messrs. Veitch, Chelsea, for *Azalea indica*.

To Messrs. Ware, Feltham, for alpinas.

**Other Exhibits.**

Messrs. Barr, King Street, Covent Garden: *Crocus* 'Bleu Celeste.'

J. T. Bennett-Poë, Esq., Cheshunt: *Camellia magnoliaeflora*.

Messrs. Cheal, Crawley: alpinas.

Messrs. Clark, Dover: alpinas.

Mrs. Denison, Berkhamsted: *Acacia cultriformis* and *Bryophyllum calycinum*.

Messrs. Eggett, Thames Ditton: hardy ferns.

Misses Hopkins, Shepperton: alpinas.

W. P. Horton, Esq., Seaford: bulbous plants.

Messrs. Low, Enfield: Carnation 'Black Chief.'

H. A. Mangles, Esq., Seale: *Rhododendron longifolium* and *R. argenteum* (received **A.M.** previously under name of *R. grande*).

Messrs. Paul, Cheshunt: new Roses, &c.

Mr. Reuthe, Keston: alpinas, shrubs, &c.

Miss A. Smith, Bognor: alpinas.

Messrs. Ware, Feltham: *Primula obconica Warei*.

FLORAL COMMITTEE, MARCH 23, 1909.

Mr. W. MARSHALL, V.M.H., in the Chair, and twenty members present.

**Awards Recommended:—**

*Silver-gilt Flora Medal.*

To Messrs. Low, Enfield, for Carnations, Acacias, &c.

To Messrs. J. Veitch, Chelsea, for Rhododendrons, &c.

*Silver-gilt Banksian Medal.*

To Mr. H. Burnett, Guernsey, for Carnations.

To Mr. W. H. Page, Hampton, for Carnations and Lilies.

To Messrs. Paul, Cheshunt, for Lilacs.

To St. George's Nursery Co., Harlington, for Cyclamen

*Silver Flora Medal.*

To Messrs. Cutbush, Highgate, for Carnations, &c.

To Messrs. May, Upper Edmonton, for hardy ferns, &c.

To Mr. L. R. Russell, Richmond, for Azaleas, Bertolonias, &c.

To Messrs. Ware, Feltham, for alpines.

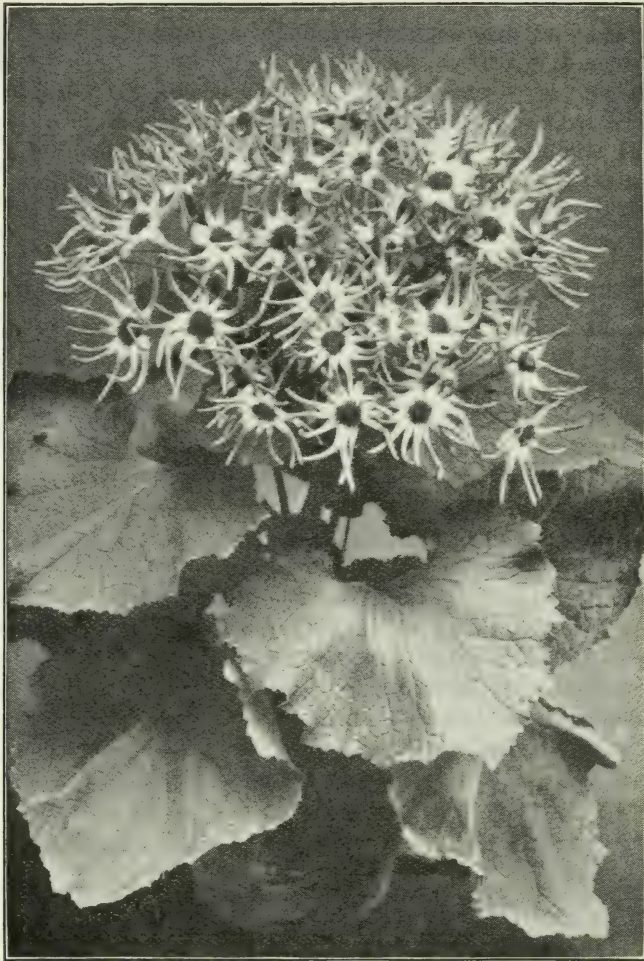


FIG. 21.—“CACTUS-FLOWERED” CINERARIA. (Sutton.) (p. lv.)

*Silver Banksian Medal.*

To Messrs. Cannell, Swanley, for *Begonia hydrocotylifolia* ‘Saturne.’

To Messrs. Cheal, Crawley, for alpines.

To Messrs. Cuthbert, Southgate, for Azaleas.

To Mr. W. H. Lancashire, Guernsey, for Carnation ‘Rose Doré.’

*Bronze Flora Medal.*

To Messrs. Peed, Streatham, for Carnations and alpines.

To Mr. G. Reuthe, Keston, for alpines.



*Bronze Banksian Medal.*

To Misses Hopkins, Shepperton, for alpine.

*First-class Certificate.*

To *Pteris aquilina congesta* (votes, unanimous), from Messrs. May, Edmonton. A very beautiful congested form of the common Bracken, growing about two feet high.

*Award of Merit.*

To *Begonia* 'Saturne' (votes, 12 for, 1 against), from Messrs. Cannell, Swanley. A light rose variety of the Mexican *B. hydrocotylifolia*. Leaves cordate, tinged on the underside with red. Flower-stalks 18 inches high, red, pilose. Flowers 1 inch across, dipetalous; capsule rose, tinged green.

To Carnation 'Rose Doré' (votes, 16 for), from Mr. W. H. Lancashire, Guernsey. A rosy-pink perpetual-flowering variety, with stiff stems and good calyx. Faintly clove-scented.

To Cineraria "Cactus-flowered" strain (votes, unanimous), from Messrs. Sutton, Reading. A very free-flowering strain, with colours ranging from white, through pink and lavender, to blue and purple. Plants very dwarf and compact. (Fig. 21.)

To *Crocus Sieberi* var. *versicolor* (votes, unanimous), from Mr. G. Reuthe, Keston. A beautiful variety collected by Moore in Greece. Flowers white, with the yellow tinge at the top of the perianth tube as in *C. Sieberi*; perianth tube and outer perianth pieces marked with purplish black.

To Rose 'Rhea Reid' (votes, 10 for, 1 against), from Mr. G. W. Piper, Uckfield. A purple-carmine Hybrid Tea; good form, but scentless. (Fig. 22.)

**Other Exhibits.**

Messrs. Bakers, Wolverhampton: alpine.

Messrs. Brooks, Basingstoke: *Primula sinensis* 'Queen Alexandra.'

Messrs. Bull, Chelsea: foliage plants and Amaryllis.

Messrs. Carter Page, London Wall, E.C.: Violas.

Messrs. F. Cant, Colchester: Rose 'Lady Roberts.'

The Earl of Clarendon, Watford: Violets.

Messrs. Clark, Dover: alpine.

Mr. Cornhill, Byfleet: Aubrietia 'Cloth of Gold.'

Guildford Hardy Plant Nursery: alpine, &c.

• Messrs. Heath, Cheltenham: Pelargoniums, &c.

Messrs. Hill, Lower Edmonton: *Osmunda palustris* var.

Mr. Pingo-Horton, Seaford: alpine, &c.

Messrs. Jarman, Chard: Cinerarias.

H. P. Keatinge, Esq., Cairo: Freesia 'Egyptian Sunrise.'

Messrs. Laing, Forest Hill: Clivias, &c.

Messrs. Paul Cheshunt: Lachenalia 'His Reverence.'

Miss Smith, Bognor: alpine.

G. Whitaker, Esq., Palermo: Violet 'Tina Whitaker.'

Miss Willmott, Warley: *Elisena longipetala*.

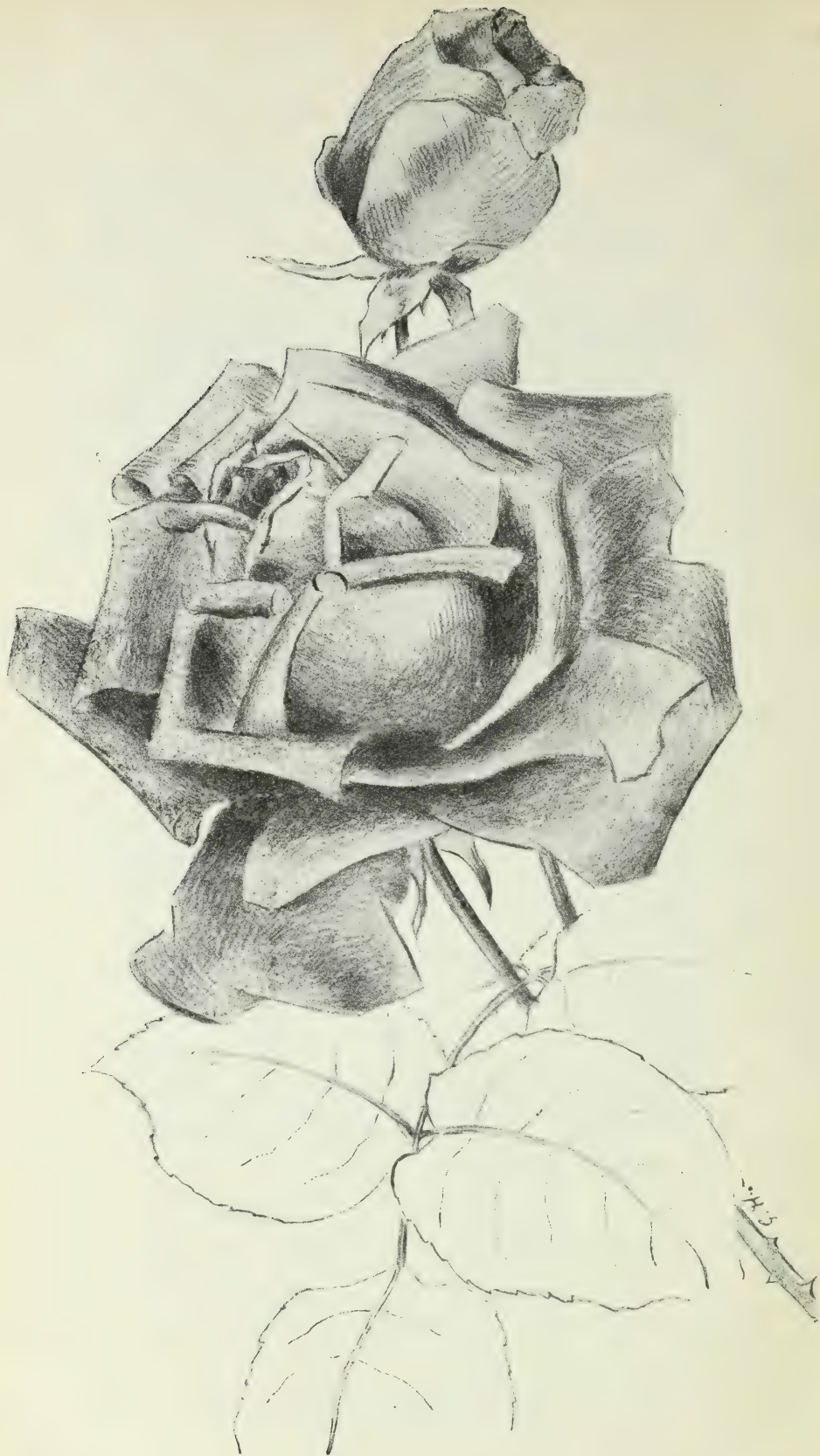


FIG. 22.—ROSE 'RHEA REID.' (*The Garden.*) (p. IV.)

## FLORAL COMMITTEE, APRIL 6, 1909.

Mr. W. MARSHALL, V.M.H., in the Chair, and twenty members present.

**Awards Recommended:—***Silver-gilt Flora Medal.*

- To Messrs. Cuthbert, Southgate, for forced shrubs.
- To Messrs. Veitch, Chelsea, for shrubs, &c.

*Silver-gilt Banksian Medal.*

- To Messrs. Cutbush, Highgate, for Carnations, &c.

*Silver Flora Medal.*

- To Mr. Burnett, Guernsey, for Carnations.
- To Messrs. Low, Enfield, for Acacias, Carnations, &c.
- To Messrs. May, Edmonton, for ferns and flowering plants.
- To Mr. Page, Hampton, for Roses, Lilies, and Carnations.
- To Messrs. Paul, Waltham Cross, for flowering shrubs.
- To Mr. Prince, Longworth, for Roses.
- To Messrs. Wallace, Colchester, for alpines.

*Silver Banksian Medal.*

- To Miss Alexander, Seal, for Roses, Violets, &c.
- To Messrs. Cannell, Swanley, for Begonias.
- To Messrs. F. Cant, Colchester, for Roses.
- To Misses Hopkins, Shepperton, for alpines.
- To Messrs. Jackman, Woking, for alpines.
- To Major Lister, Hayward's Heath, for Amaryllis.
- To Messrs. Peed, Streatham, for Caladiums.
- To E. H. Johnstone, Esq., Groombridge, for Carnations.
- To Mr. Reuthe, Keston, for alpines, &c.
- To Mr. Russell, Richmond, for flowering shrubs.
- To Messrs. Sutton, Reading, for Cinerarias.
- To Messrs. Ware, Feltham, for alpines, &c.

*Bronze Flora Medal.*

- To Messrs. Bakers, Codsall, for alpines.

*Bronze Banksian Medal.*

- To Mrs. Bischoffsheim, Stanmore, for *Lachenalia tricolor*.

*Award of Merit.*

To *Hippeastrum* 'Magnificent' (votes, unanimous), from Messrs. R. Ker, Liverpool. Flowers of good form, on a stout stalk 18 inches high; ground colour white, almost entirely hidden by a beautiful brilliant scarlet. Leaves at flowering time small.

To *Hippeastrum* 'Marcus' (votes, unanimous), from Messrs. Veitch, Chelsea. A large flat flower of a bright scarlet colour; back of perianth pieces tinged with green at apex, and shaded crimson at base. Stalk 15 inches long, rigid. Leaves at flowering time very small.



To *Saxifraga apiculata alba* (votes, unanimous), from the Guildford Hardy Plant Nursery. A beautiful creamy white form of the well-known *S. apiculata*. The carpels and anthers are yellow. Flowers freely borne on short, leafy shoots.

### Other Exhibits.

- Messrs. Carter Page, London Wall, E.C. : *Violas*.  
 Messrs. Clark, Dover : alpinas, &c.  
 R. Farrer, Esq., Clapham, Yorks : *Saxifraga Stribnryi*.  
 G. Fellows, Esq., Nottingham : Hybrid Scilla.  
 T. Firth, Esq., J.P., Heckmondwike, Yorks : variegated *Deutzia gracilis*.  
 Mr. R. E. Gill, Falmouth : Rhododendrons.  
 Glasnevin Botanic Gardens : *Sarracenia*s.  
 Guildford Hardy Plant Nursery : alpinas.  
 Sir Everard Hambro, Hayes : *Primula verticillata*.  
 Mr. Hardy, Seaton, Devon : *Viola odorata* 'Sir Wilfred Peek.'  
 Messrs. Ker, Liverpool : *Amaryllis*.  
 Sir Trevor Lawrence, Bart., K.C.V.O., V.M.H. : *Viola odorata* 'Cyclops.'  
 Messrs. Low, Enfield : *Acacias*, *Carnations*, &c.  
 Miss Mangles, Seale : Rhododendrons.  
 W. J. Newman, Esq., Totteridge Park : *Amaryllis*.  
 Messrs. Paul, Cheshunt : climbing *Roses*, &c.  
 Mr. H. E. Pulham, Stanstead : alpinas.  
 Messrs. Veitch, Chelsea : *Amaryllis Erlangea tomentosa*, and *Azalea indica* 'Jean Peters.'  
 Messrs. Whitelegg and Page, Chislehurst : *Cyclamen*.

### FLORAL COMMITTEE, APRIL 20, 1909.

Mr. W. MARSHALL, V.M.H., in the Chair, and twenty-two members present.

### Awards Recommended :—

#### *Silver Flora Medal.*

- To Messrs. Carter, Holborn, for *Schizanthus*.  
 To Messrs. Cutbush, Highgate, for forced shrubs.  
 To Messrs. Low, Enfield, for *Roses*, *Carnations*, &c.  
 To Messrs. May, Edmonton, for ferns and flowering plants.  
 To Mr. G. Mount, Canterbury, for *Roses*.  
 To Mr. W. H. Page, Hampton, for *Carnations*, *Lilies* and *Roses*.  
 To Messrs. W. Paul, Waltham Cross, for *Roses* in pots.  
 To Mr. G. Prince, Longworth, for *Roses*.  
 To Messrs. Veitch, Chelsea, for *Cinerarias*, &c.

#### *Silver Banksian Medal.*

- To Messrs. Wallace, Colchester, for alpinas, &c.  
 To Sir G. Loder, Bart., Leonardslee, for Rhododendrons, &c.

*Bronze Flora Medal.*

To Messrs. Cannell, Swanley, for Zonal Pelargoniums.

To Messrs. Sutton, Reading, for Italian Hyacinths and Freesias.

*Bronze Banksian Medal.*

To Messrs. Dobbie, Rothesay, for Pansies, &c.

To the Guildford Hardy Plant Nursery, for alpinas.

To Messrs. Ware, Feltham, for alpinas.

*First-class Certificate.*

To *Bougainvillea* 'Rosa Catelina' (votes, unanimous), from Colonel Petre, Westwick House, Norwich. A very free-flowering variety, with large bracts of a bright rosy-scarlet. Flowers borne on arching stems. Introduced from Las Palmas, Grand Canary.

To *Primula Forrestii* (votes, unanimous), from Messrs. Bees, Liverpool. A new species collected by Mr. Forrest on the limestone cliffs of Yunnan, at an altitude of 9000 feet. Umbels of dark yellow drooping flowers, half-inch across, with a faint zone of orange round the eye. Leaves elliptic, cordate, crenate; petioles long. The whole plant glandular hairy. Said to be quite hardy at Liverpool. (Fig. 23.)

*Award of Merit.*

To Auricula 'Admiration' (votes, unanimous), from Mr. J. Douglas, V.M.H., Great Bookham. Good circular white-centred alpine. Violet, shading off to the light-blue edge. Well-formed truss.

To Auricula 'Claud Halcro' (votes, unanimous). Another alpine variety from Mr. Douglas. Beautiful golden centre. Rich maroon, shading off to light red. Enormous truss, with large, well-formed pips.

To Auricula 'Robert Bruce' (votes, 18 for, 4 against), from the same raiser. Large, beautifully proportioned flower. Centre white; ground colour dark purple fading to heliotrope, a somewhat unusual colour among alpine auriculas. Good truss.

To Auricula 'Ulleswater' (votes, 22 for, 1 against), from Mr. Douglas. Large white-centred alpine. Flowers of very good form. Ground colour purple, gradually shading to heliotrope.

To Malmaison Carnation 'Lady Coventry' (votes, 16 for, 1 against), from Messrs. Cutbush, Highgate. Flower about  $4\frac{1}{2}$  inches across, cerise, strongly clove-scented. The calyx is weak, and the flower too large for the stems, which require the support of wires.

To *Hippeastrum* 'Pinkie' (votes, unanimous), from Lieut.-Colonel Holford, C.V.O., C.I.E., Westonbirt. Flowers rather small, but of excellent form; white, veined and shaded rosy-scarlet; throat tinged with green; 2 feet high, robust.

To *Hippeastrum* 'Gracchus' (votes, unanimous), from Messrs. Veitch, Chelsea. Large, well-formed flower, bright scarlet, shading to crimson in the throat; perianth-segments broad, of good substance; vigorous.

To *Saxifraga decipiens hybrida grandiflora* (votes, unanimous), from Mr. T. Kitley, Bath. A beautiful crimson variety of *Saxifraga decipiens*.



FIG. 23.—*PRIMULA FORRESTII*. (*Bees.*) (p. lix.)



**Other Exhibits.**

J. S. Arkwright, Esq., M.P., Lulworth: *Primula* 'Evelyn Arkwright.'

Messrs. Bakers, Codsall: alpinas.

Messrs. Barr, Covent Garden: *Saxifraga* 'Ditton Crimson.'

Messrs. Bunyard, Maidstone: alpinas.

Messrs. F. Cant, Colchester: climbing Roses.

Messrs. B. Cant, Colchester: Roses.

Messrs. Carter Page, London Wall: Violas.

Messrs. Cheal, Crawley: Roses.

Messrs. Clark, Dover: alpinas, &c.

Countess Cowper, Panshanger: Roses and Violets.

Messrs. Gunn, Olton: *Ranunculus montanus*.

Misses Hopkins, Shepperton: alpinas.

Lieut.-Colonel Holford, C.V.O., C.I.E., Westonbirt: Amaryllis.

Messrs. Jackman, Woking: alpinas.

H. Little, Esq., Twickenham: Clivias.

Messrs. Low, Enfield: Roses and Azaleas.

Messrs. Paul, Cheshunt: Roses.

Messrs. Peed, Streatham: alpinas, &c.

Mr. H. E. Pulham, Stanstead: alpinas.

Mr. G. Reuthe, Keston: alpinas, &c.

Miss Smith, Bognor: alpinas.

Miss Willmott, V.M.H., Warley: *Arctotis aureola robusta*.

## ORCHID COMMITTEE.

JANUARY 12, 1909.

Mr. J. GURNEY FOWLER in the Chair, and twenty-two members present.

### Awards Recommended :—

*Silver-gilt Flora Medal.*

To Messrs. Charlesworth, Hayward's Heath, for a group.

*Silver Flora Medal.*

To Sir Jeremiah Colman, Bart., V.M.H., Gatton Park, Reigate, for a group of hybrids raised at Gatton Park, and for singular species of Orchids.

*Silver Banksian Medal.*

To Messrs. Hugh Low, for a group.

*First-class Certificate.*

To *Cattleya Percivaliana*, Charlesworth's variety (votes, unanimous), from Messrs. Charlesworth. Flowers pure white with ruby-crimson blotch and yellow disc to the lip.

*Award of Merit.*

To *Cattleya* × 'Maggie Raphael,' Westonbirt variety (*C. Dowiana aurea* × *C. Trianaei* 'Imperator') (votes, unanimous), from Lieut.-Col. G. L. Holford, C.I.E. C.V.O., Westonbirt (gr. Mr. H. G. Alexander). Sepals and petals rose colour with a white veining. Lip glowing mauve-crimson, the base veined with bright yellow.

To *Vanda Watsonii* (votes, unanimous), from Lieut.-Col. G. L. Holford, C.I.E., C.V.O. Allied to *V. Kimballiana*. Flowers white. The plant bore four spikes.

To *Odontoglossum* × *ardentissimum* 'Norman Cookson' (*O. Pescatorei* × *O. crispum*) (votes, 12 for, 4 against), from Norman C. Cookson, Esq., Oakwood, Wylam (gr. Mr. H. J. Chapman). Flowers white, heavily blotched with purple.

*Cultural Commendation.*

To Mr. H. Ballantine, gr. to Sir H. Schröder, The Dell, Egham, for *Masdevallia ignea* with over seventy flowers.

### Other Exhibits.

Sir Trevor Lawrence, Bart., K.C.V.O. : *Odontoglossum* hybrid.

Francis Wellesley, Esq. : *Sophrocattleya* × 'Mrs. Francis Wellesley' (*S. grandiflora* × *C. labiata*).

Lieut.-Col. G. L. Holford, C.I.E., C.V.O. : hybrids.

Messrs. Veitch : hybrid *Cypripediums*.



FIG. 24.—*LAELIOCATTELEYA* × 'FELICIA.' (*Gardeners' Chronicle*.)  
(p. lxiii.)

(To face page lxii.)





Messrs. McBean : *Odontoglossums*.

Norman C. Cookson, Esq. : *Cypripediums*.

H. J. Bromilow, Esq. : *Cypripedium Charlesworthii Bromilowiae*.

H. T. Pitt, Esq. : *Maxillaria Hubschii* and *Cypripediums*.

Messrs. Armstrong & Brown : *Cypripediums*.

Henry Little, Esq. : *Cypripedium insigne*, Little's variety.

Monsieur Mertens : *Odontoglossums*.

R. G. Thwaites, Esq. : *Cattleya* × 'Leda,' Thwaites variety (*Dowiana aurea* × *Percivaliana*).

#### ORCHID COMMITTEE, JANUARY 26, 1909.

Mr. J. GURNEY FOWLER in the Chair, and eighteen members present.

#### Awards Recommended :—

##### *Silver Flora Medal.*

To Messrs. Charlesworth, Hayward's Heath, for a group of hybrid Orchids.

##### *Silver Banksian Medal.*

To Messrs. Hugh Low, for a group.

To Messrs. Cypher, for *Cypripediums*.

To Mr. A. W. Jensen, for *Odontoglossum crispum*.

##### *First-class Certificate.*

To *Sophrolaeliocattleya* × 'Marathon' var. 'Vesuvius' (*S.-l.* × 'Psyche' × *C.* × 'Empress Frederick') (votes, unanimous), from Messrs. Charlesworth. Flowers ruby-red with a yellow tint.

To *Laeliocattleya* × 'Felicia' (*L.-c.* × *Haroldiana* × *C. Trianaei*) (votes, unanimous), from Messrs. Charlesworth. A large pale-rose flower with purplish claret front to the lip. (Fig. 24.)

To *Cypripedium* × 'Earl of Tankerville' (*Exul* × *nitens*, Sanders variety) (votes, unanimous), from Lieut.-Col. G. L. Holford, C.I.E., C.V.O. (gr. Mr. H. G. Alexander). A portion of the plant which received an **A.M.** January 9, 1906. Dorsal sepal white with pale green base, heavily blotched with purple. Petals and lip yellow marked with red-brown. (Fig. 25.)

##### *Award of Merit.*

To *Cypripedium* × 'Hera Euryades,' New-Hall-Hey variety (*Leeanum superbum* × *Boxallii*) (votes, 13 for, 3 against), from J. Forster Alcock, Esq., Northchurch. Dorsal sepal white tinged with purple and spotted with chocolate-purple. Petals and lip yellow tinged with red-brown.

To *Cypripedium* × 'Our Queen' (*Leeanum* × *Stevensii*) (votes, unanimous), from W. Thompson, Esq., Walton Grange, Stone (gr. Mr. Stevens). Resembling *C. Leeanum* in its markings, but with the white dorsal sepal more densely spotted with deep rose.

**Other Exhibits.**

Sir Jeremiah Colman, Bart. : a group.

Mr. F. McBean : *Cattleyas* and *Odontoglossums*.



FIG. 25.—*CYPRIPEDIUM* × 'EARL OF TANKERVILLE.' (*Gardeners' Chronicle*.)  
(p. lxiii.)

Francis Wellesley, Esq. : *Cattleya Trianaei* 'The Premier.'

Lieut.-Col. G. L. Holford, C.I.E., C.V.O. : four new hybrids.

Mr. F. Hanson, Somerleyton : spikes of *Calanthe*.

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ORCHID COMMITTEE, FEBRUARY 9, 1909.

Mr. J. GURNEY FOWLER in the Chair, and twenty-six members present.

**Awards Recommended :—**

*Gold Medal.*

To Messrs. Charlesworth, Hayward's Heath, for a large group, including many plants of *Phalaenopsis Schilleriana*.



*Lindley Medal.*

To Mr. H. G. Alexander, Orchid grower to Lieut.-Col. G. L. Holford, C.I.E., C.V.O., for a specimen of *Odontoglossum*  $\times$  *crispo-Harryanum* with four spikes, bearing together 125 flowers.

*Silver-gilt Flora Medal.*

To Norman C. Cookson, Esq., Oakwood, Wylam (gr. Mr. H. J. Chapman), for rare *Odontoglossums*.

*Silver Flora Medal.*

To Messrs. McBean, Cooksbridge, for a group of white *Laelia anceps*.

To Messrs. Cypher, Cheltenham, for *Cypripediums* and *Calanthes*.

To Messrs. Hugh Low, for a group.

*Silver Banksian Medal.*

To Messrs. Veitch, for *Odontoglossums* and *Cypripediums*.

To Messrs. Moore, Rawdon, Leeds, for a group of *Cypripediums*.

*First-class Certificate.*

To *Odontoglossum*  $\times$  *ardentissimum* 'Phœbe' (*Pescatorei*  $\times$  *crispum*) (votes, unanimous), from Norman C. Cookson, Esq. (gr. Mr. Chapman).



FIG. 26.—*ODONTOGLOSSUM*  $\times$  *ARDENTISSIMUM* 'PHŒBE.' (*Gardeners' Chronicle*.)

Flowers deep reddish-claret colour on the inner parts of the segments, the tips and margins being pure white. (Fig. 26.)

*Award of Merit.*

To *Laeliocattleya* × 'Goldfinch' *superba* (*L.-c. warnhamiensis* × *C. Dowiana aurea*) (votes, 20 for, 1 against), from Lieut.-Col. G. L. Holford, C.I.E., C.V.O. (gr. Mr. Alexander). A profuse-flowering hybrid with bright yellow flowers with crimson-purple lips bearing orange lines at the base.

To *Cypripedium* × 'Leander,' Exhims variety (*villosum* × *Leeanum*) (votes, 14 for, 7 against), from J. Forster Alcock, Esq., Exhims, Northchurch. Dorsal sepal white spotted with purple. Lip and petals greenish-yellow tinged with purple.

**Other Exhibits.**

His Grace the Duke of Marlborough: *Cattleya Trianaei*, Blenheim variety.

Sir Trevor Lawrence, Bart., K.C.V.O.: *Epidendrum erubescens*.

Sir Jeremiah Colman, Bart.: rare Orchids.

Sir W. Marriott: two *Soprocattleyas*.

Lieut.-Col. G. L. Holford, C.I.E., C.V.O.: hybrids.

R. G. Thwaites, Esq.: *Odontioda Bradshawiae*.

W. Bolton, Esq.: *Cypripedium* × 'Iris' *magnificum*.

Mr. F. McBean: *Odontoglossums* and *Cattleyas*.

Monsieur Mertens: hybrid *Odontoglossums*.

Messrs. Armstrong & Brown: *Cypripedium* × 'Hera.'

Messrs. Duchesne, Belgium: *Cattleya Schroderae* 'The Giant.'

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ORCHID COMMITTEE, FEBRUARY 23, 1909.

Mr. HARRY J. VEITCH in the Chair, and twenty-six members present.

**Awards Recommended:—**

*Silver-gilt Flora Medal.*

To Messrs. Sander, St. Albans, for a group in which the hybrid *Odontoglossums* and *Phalaenopsis Schilleriana* were remarkable.

*Silver Flora Medal.*

To Messrs. Charlesworth, Hayward's Heath, for hybrids.

*Silver Banksian Medal.*

To Messrs. Cypher, Cheltenham, for a group.

To Monsieur Mertens, Ghent, for hybrid *Odontoglossums*.

*First-class Certificate.*

To *Laeliocattleya* × 'Pizarro,' Westonbirt variety (*L. Jongheana* × *C. Dowiana aurea*) (votes, unanimous), from Lieut.-Col. G. L. Holford, C.I.E., C.V.O. (gr. Mr. H. G. Alexander). Flowers as large as those of *C. Dowiana*, rose coloured, with gold veining on the lip. (Fig. 27.)

To *Cattleya Trianaei Mooreana* (votes, 13 for, 5 against), from Lieut.-Col. G. L. Holford, C.I.E., C.V.O. Flowers of good shape. Sepals and petals silver-white tinged with rose, the petals having a claret-purple band. Lip deep claret-purple with yellow disc.



FIG. 27.—*LAELIOCATTLEYA* × 'PIZARRO,' WESTONBIRT VARIETY. *Gardeners' Chronicle.*)

(To face page lxvi.)





To *Odontioda* × 'Lutetia' (*O. luteo-purpureum* × *C. Noezliana*) (votes, unanimous), from Messrs. Charlesworth. Flowers resembling those of *O. luteo-purpureum*, yellowish, mottled and tinged with cinnabar-scarlet. (Fig. 28.)

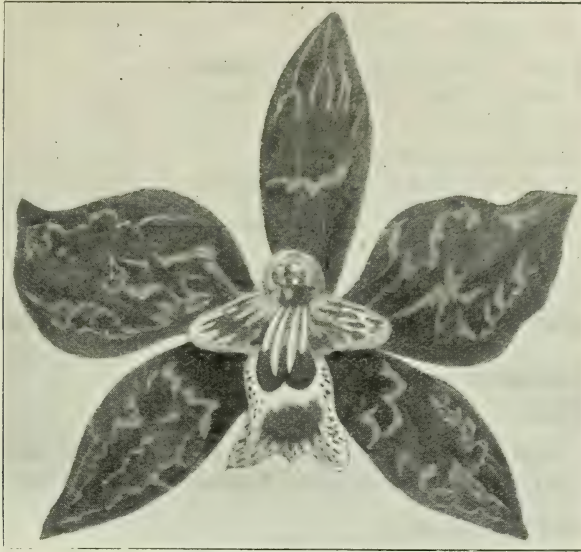


FIG. 28.—ODONTIODA × 'LUTETIA.' (*Journal of Horticulture*.)

#### *Award of Merit.*

To *Dendrobium* × 'Lady Colman' ('Artemis' × *Findlayanum*) (votes, unanimous), from Sir Jeremiah Colman, Bart., Gatton Park (gr. Mr. Collier). A large and beautiful hybrid, white, with the outer halves of the sepals and petals tinged with rose. The labellum has a maroon disc, in front of which is a white band, the apex being rose colour.

To *Cynoches peruvianum*, Tracy's variety (votes, 9 for, 4 against), from Mr. H. A. Tracy, Twickenham. Flowers greenish, sparsely spotted with purple and densely set on the inflorescence.

To *Odontioda* × *keighleyensis* (*O. cirrhosum* × *C. Noezliana*) (votes, unanimous), from Messrs. Charlesworth. Inflorescence branched; flowers formed nearly like *O. cirrhosum*; blood-red.

To *Cymbidium* × *Woodhamsianum*, Orchidhurst variety (*Lowianum* × *eburneo-Lowianum*) (votes, unanimous), from Messrs. Armstrong & Brown. Flowers large, greenish-white with red markings on the lip.

#### *Botanical Certificate.*

To *Odontoglossum cariniferum*, from de B. Crawshay, Esq. (gr. Mr. Stables). Inflorescence 3 feet, branched. Flowers brownish with white lip.

#### *Certificate of Appreciation.*

To *Dendrobium* × *atro-Brymerianum* (*atroviolaceum* × *Brymerianum*), from R. G. Thwaites, Esq., Streatham (gr. Mr. Black). A very

interesting hybrid, in which the predominance of *D. atrovioleaceum* and the suppression of the fringing on the lip of *D. Brymerianum* is very remarkable. Flowers formed like *D. atrovioleaceum*, whitish-green with minute purple spots, the lip being veined with dark purple.

### Other Exhibits.

Lieut.-Col. Holford : hybrids.

Sir Jeremiah Colman, Bart. : rare species.

de B. Crawshay, Esq. : *Odontoglossums*.

W. Waters Butler, Esq. : a group.

Messrs. McBean : a group.

J. Gurney Fowler, Esq. : *Odontoglossum* × *Smithii*.

### ORCHID COMMITTEE, MARCH 9, 1909.

Mr. J. GURNEY FOWLER in the Chair, and twenty-nine members present.

### Awards Recommended :—

#### *Gold Medal.*

To Sir Jeremiah Colman, Bart., V.M.H., Gatton Park, Reigate (gr. Mr. Collier), for a group of hybrid *Dendrobiums* and other Orchids.

#### *Silver-gilt Flora Medal.*

To Messrs. Charlesworth, Hayward's Heath, for a group.

#### *Silver Flora Medal.*

To Messrs. Sander, St. Albans, for a group of hybrid *Odontoglossums*.

To Messrs. Hugh Low, for a group.

#### *Silver Banksian Medal.*

To Messrs. Cypher, Cheltenham, for hybrid *Cypripediums* and *Cattleyas*.

To Monsieur Mertens, Ghent, for hybrid *Odontoglossums*.

#### *First-class Certificate.*

To *Cattleya Schroderae* 'Mrs. F. Sander' (votes, unanimous), from Messrs. Sander. A fine, pure white flower with chrome-yellow disc to the lip.

To *Odontioda* × *Bradshawiae*, Cookson's variety (*O. crispum* × *C. Noezliana*) (votes, unanimous), from Norman C. Cookson, Esq., Oakwood, Wylam (gr. Mr. Chapman). Flowers equal to *O. crispum*; cinnabar-scarlet with white tip and margins to the segments, tinged with rose. (Fig. 29.)

To *Soprocattleya* × *Thwaitesii* (*S. grandiflora* × *C. Mendelii*) (votes, 16 for, 2 against). Flowers carmine-rose with a yellow base to the lip.

To *Cattleya Trianaei* 'Grand Monarch' (votes, unanimous), from F. Menteith Ogilvie, Esq., The Shrubbery, Oxford (gr. Mr. Balmforth). A very large and handsome variety with rosy-lilac flowers, having the front of the lip purplish-crimson.



*Award of Merit.*

To *Odontoglossum*  $\times$  *Wyonianum* (parentage unrecorded) (votes, unanimous), from J. Gurney Fowler, Esq. (gr. Mr. J. Davis). A pretty white flower with confluent spotting of reddish-purple in the inner parts of the segments.

*Botanical Certificate.*

To *Chytroglossa Marileoniae*, from Messrs. Sander. A dwarf species with pendent racemes of small flowers.

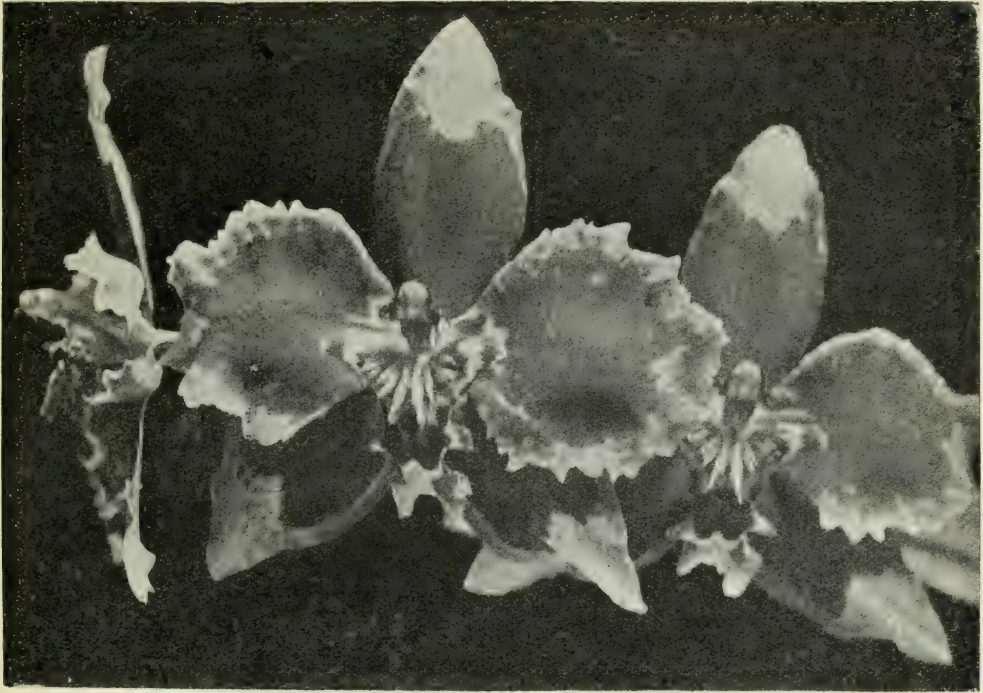


FIG. 34.—*ODONTOGLOSSUM*  $\times$  'THEODORA.' (*Gardeners' Chronicle*.)  
(p. lxviii.)

*Cultural Commendation.*

To Mr. H. Ballantine, gr. to Baron Sir H. Schröder, for a fine specimen of *Cymbidium insigne* with three spikes, 5 feet in height.

To Mr. Salter, gr. to Walter Cobb, Esq., for *Coelogyne cristata alba* with about fifty spikes.

**Other Exhibits.**

Lieut.-Col. G. L. Holford, C.I.E., C.V.O.: hybrid orchids.

H. S. Goodson, Esq.: *Odontioda*  $\times$  *Goodsoniae*.

Norman C. Cookson, Esq.: *Odontiodas* and *Odontoglossums*.

Messrs. Jas. Veitch: a group.

H. A. Innes, Esq.: *Cattleyas*.

Mr. W. P. Horton: a group.

ORCHID COMMITTEE, MARCH 23, 1909.

Mr. J. GURNEY FOWLER in the Chair, and twenty-two members present.

**Awards Recommended:—**

*Silver-gilt Flora Medal.*

To Messrs. McBean, Cooksbridge, for a group of *Odontoglossums*.

*Silver Flora Medal.*

To Lieut.-Col. G. L. Holford, C.I.E., C.V.O., Westonbirt, Tetbury, for hybrids.

To H. S. Goodson, Esq., Putney, for a group.

To Messrs. Charlesworth, for hybrids.

To Messrs. Cypher, for a group.



FIG. 30.—*DENDROBIUM SCHNEIDERIANUM*, WESTONBIRT VARIETY.  
(*Journal of Horticulture*.) (p. lxxi.)

*Silver Banksian Medal.*

To Messrs. Sander, for rare species.

To Messrs. Hugh Low, for a group.

To Monsieur Mertens, for *Odontoglossums*.

To Mr. A. W. Jensen, for *Odontoglossum crispum* and *Cattleya Schröderae*.

*Award of Merit.*

To *Brassocattleya* × *Digbyano-Mendelii perfecta* (*B. Digbyana* × *C. Mendelii*) (votes, unanimous), from Lieut.-Col. G. L. Holford, C.I.E.,

C.V.O. (gr. Mr. H. G. Alexander). A finely formed white flower tinged with pink and with cowslip-yellow disc to the fringed lip.

To *Dendrobium* × *Schneiderianum*, Westonbirt variety (*aureum* × *Findlayanum*) (votes, unanimous), from Lieut.-Col. G. L. Holford, C.I.E., C.V.O. Flowers of the size and form of *D. Findlayanum*, white with the tips of the segments rose. Disc of the lip deep orange. (Fig. 30.)

To *Sophrolaeliocattleya* × 'Olive' (S.-l. 'Psyche' × *C.* × 'Enid'), (votes, unanimous), from J. Gurney Fowler, Esq., Woodford (gr. Mr. J. Davis). A showy dwarf hybrid with flowers deep reddish-mauve with gold markings on the lip.

#### *Cultural Commendation.*

To Mr. H. G. Alexander, gr. to Lieut.-Col. G. L. Holford, C.I.E., C.V.O., for two magnificent specimens of *Cymbidium* × *eburneo-Lowianum*, the one with nineteen flower-spikes bearing together ninety-one flowers; the other thirty-two spikes with one hundred and fifty fine flowers.

#### **Other Exhibits.**

de B. Crawshay, Esq.: *Odontoglossum Lambeauianum*.

Mrs. Temple: *Lycaste Skinneri*.

J. Forster Alcock, Esq.: hybrid *Cypripedium*.

Mrs. Haywood: hybrid *Dendrobiums*.

Messrs. Keeling: *Odontoglossum nebulosum*, and tubes for storing Orchid pollen.

#### ORCHID COMMITTEE, APRIL 6, 1909.

Mr. J. GURNEY FOWLER in the Chair, and twenty-one members present.

#### **Awards Recommended:—**

##### *Gold Medal.*

To Messrs. Armstrong & Brown, Tunbridge Wells, for *Dendrobiums*, &c.

##### *Silver Flora Medal.*

To H. S. Goodson, Esq. (gr. Mr. G. E. Day), for *Odontoglossums*, *Odontiodas*, &c.

To Messrs. Charlesworth, for hybrids.

To Messrs. Sander, for *Cattleyas*, &c.

To Messrs. McBean, for *Odontoglossums*.

To Messrs. J. Veitch, for a group.

##### *Silver Banksian Medal.*

To Mr. Jensen, for fine forms of *Cattleya Schroderae* and *Odontoglossum crispum*.

To Messrs. Hugh Low, for a group.

To Monsieur Mertens, Ghent, for hybrid *Odontoglossums*.

##### *First-class Certificate.*

To *Cattleya Schröderae* 'The Baron' (votes, unanimous) from Lieut.-Col. G. L. Holford, C.I.E., C.V.O., Westonbirt (gr. Mr. Alexander). The



famous variety first shown at the Temple Show, 1905. Flowers of a delicate peach-blossom tint, the disc of the lip orange.

To *Cattleya Schroderae* 'Irene' (votes, 12 for, 4 against), from Mr. Jensen, Lindfield. A very large white flower tinged with lilac. (Fig. 31.)

To *Odontoglossum*  $\times$  *percultum*, Cookson's variety (*ardentissimum*  $\times$  *Rolfeae*) (votes, unanimous), from Norman C. Cookson, Esq. (gr. Mr. Chapman). A perfectly formed flower heavily blotched with purple on a white ground.

To *Odontioda*  $\times$  'Ernest Henry' ( $\times$  *Odontoglossum* 'Queen Alexandra'  $\times$  *Cochlioda Noezliana*), from H. S. Goodson, Esq. Flowers shaped like those of *O.*  $\times$  *Charlesworthii*; mahogany-red with yellow crest to the lip. (Fig. 32.)



FIG. 32.—ODONTIODA  $\times$  'ERNEST HENRY.' (*Gardeners' Chronicle*.)

#### *Award of Merit.*

To *Odontoglossum*  $\times$  'Sylvia,' Westonbirt variety (*cirrhosum*  $\times$  *Rolfeae*) (votes, unanimous), from Lieut.-Col. G. L. Holford, C.I.E., C.V.O. Flowers yellowish, blotched with purple.

To *Cattleya Schroderae* 'Alexandra James' (votes, unanimous), from W. James, Esq., West Dean Park, Chichester. A large bluish-white flower with yellow disc to the lip.

To *Odontoglossum*  $\times$  'Dreadnought' ( $\times$  Prince Albert, nat. hyb.  $\times$  *sceptrum*) (votes, 12 for, 2 against), from Messrs. Sander. Flowers resembling a very large *O. sceptrum* with the colour and markings of *O. triumphans*.

To *Laeliocattleya*  $\times$  'Frederick Boyle' var. *Kerchoreae* (*L. anceps alba*  $\times$  *C. Trianaei alba*) (votes, unanimous), from Sir Trevor Lawrence, Bart., K.C.V.O. (gr. Mr. W. H. White). Flowers uniformly bluish-white.

To *Odontoglossum crispum* 'Angela' (votes, 13 for, 2 against), from



FIG. 31.—CATTLEYA SCHRODERAE 'IRENE.'

(To face page lxxii.)







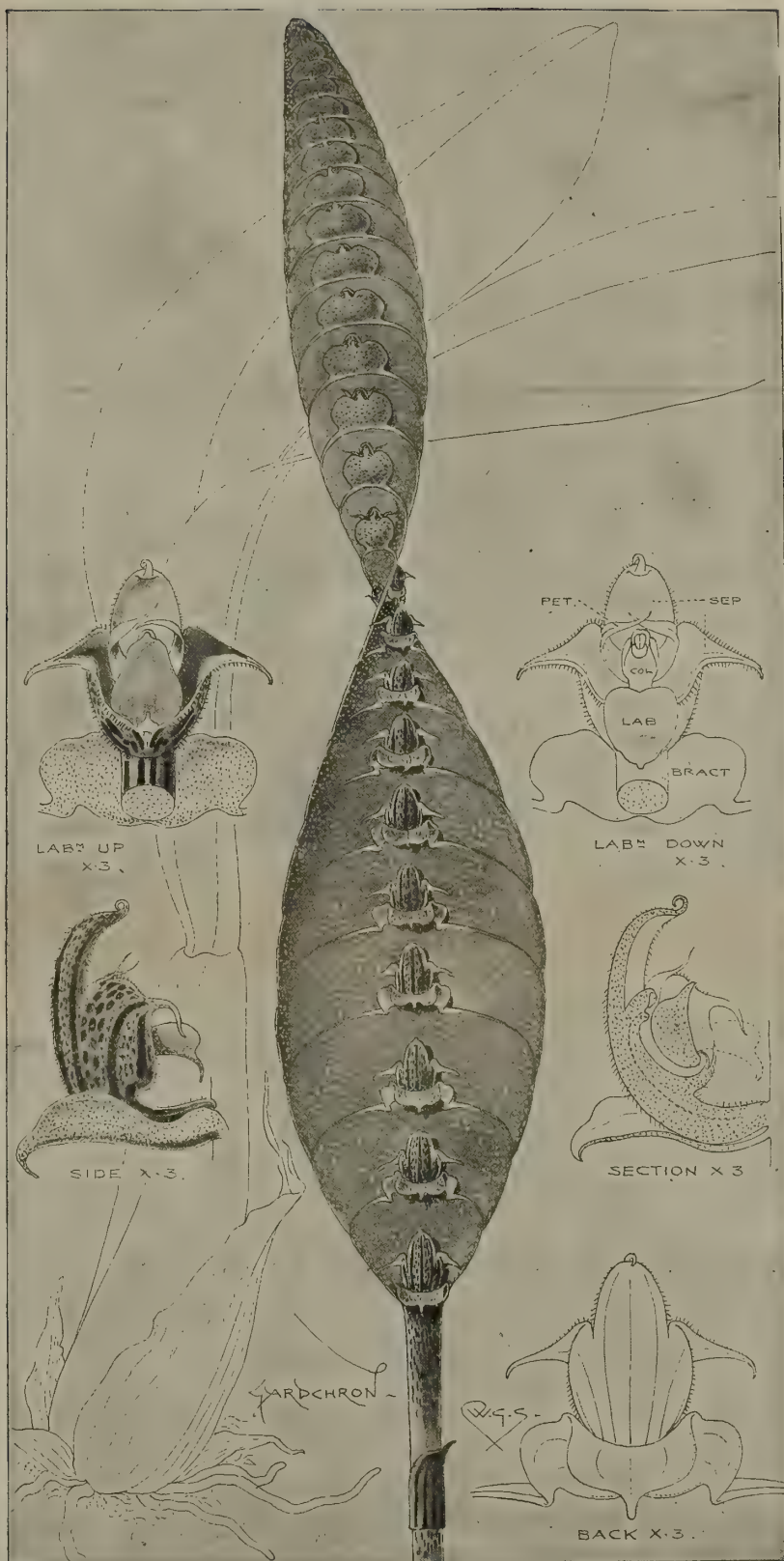


FIG. 33.—MEGACCLINIUM PURPUREO-RACHIS. (*Gardeners' Chronicle*.)  
(To face page lxxiii.)

Norman C. Cookson, Esq. A large white flower heavily blotched with purple.

*Botanical Certificate.*

To *Megaclinium purpureo-rachis*, from Sir Trevor Lawrence, Bart. A large species from tropical Africa. The inflorescence has a broad flat-bladed purple rachis, on each side of which is a row of small toad-like brownish flowers. (Fig. 33.)

To *Polystachya rhodoptera*, from Sir Trevor Lawrence, Bart. Stems slender, 1 ft.; flowers on the upper part, yellowish, tinged with rose.

**Other Exhibits.**

Lieut.-Col. G. L. Holford, C.I.E., C.V.O. : hybrid.

R. G. Thwaites, Esq. : hybrid *Dendrobiums*.

de B. Crawshay, Esq. : hybrid *Odontoglossums*.

Sir Trevor Lawrence, Bart., K.C.V.O. : rare species.

Messrs. Cypher : *Dendrobiums*.

Francis Wellesley, Esq. : *Cattleya Trianaei* 'Marie Feodorovna.'

W. Thompson, Esq. : *Odontoglossums*.

J. Forster Alcock, Esq. : *Cypripediums*.

J. S. Moss, Esq. : *Odontoglossum* × *Kenchii* (*Kegeljani* × *Denisoniae Mossiae*).

ORCHID COMMITTEE, APRIL 20, 1909.

Mr. J. GURNEY FOWLER in the Chair, and twenty-two members present.

**Awards Recommended :—**

*Silver Flora Medal.*

To H. T. Pitt, Esq., Rosslyn, Stamford Hill, for a group.

To Messrs. Charlesworth, for rare Orchids.

To Messrs. Sander, for hybrids and interesting species.

To Messrs. Cypher, for *Dendrobiums* and *Cattleyas*.

To Messrs. Hugh Low, for a group.

*Silver Banksian Medal.*

To Mr. A. W. Jensen, for *Cattleyas* and *Odontoglossums*.

*First-class Certificate.*

To *Odontoglossum* × 'Theodora' (*Rossii rubescens* × *triumphans*) (votes, unanimous), from de B. Crawshay, Esq., Rosefield, Sevenoaks (gr. Mr. Stables). A remarkably pretty hybrid of dwarf habit. Flowers produced on short spikes. Sepals and petals canary-yellow, the greater part of their surface being covered with deep reddish-claret blotches. Lip white with a dark red curved blotch in front of the yellow crest. (Fig. 34.)

*Award of Merit.*

To *Laeliocattleya* × 'Golderest' (*C. Schröderae* × *L. Cowanii*), (votes, unanimous), from Lieut.-Col. G. L. Holford, C.I.E. C.V.O. (gr.



Mr. H. G. Alexander). Flowers, ten or twelve on an erect spike, bright chrome-yellow.

To *Cattleya* × 'Robert de Wavrin' (*Schröderae* × *Schilleriana*) (votes, unanimous), from Lieut.-Col. G. L. Holford. A large flower, tinged with rose and having dark rose veining on the lip.

To *Odontoglossum* × *loochristiense aureo-fulvum* (*crispum* × *triumphans*) (votes, 13 for, 4 against), from Sir Trevor Lawrence, Bart., K.C.V.O. (gr. Mr. W. H. White). A pretty bright-yellow flower, blotched with chocolate. Lip white with brown spots.

To *Miltonia* × *Bleuana*, Sander's variety (*vexillaria* × *Rochlii*) (votes,

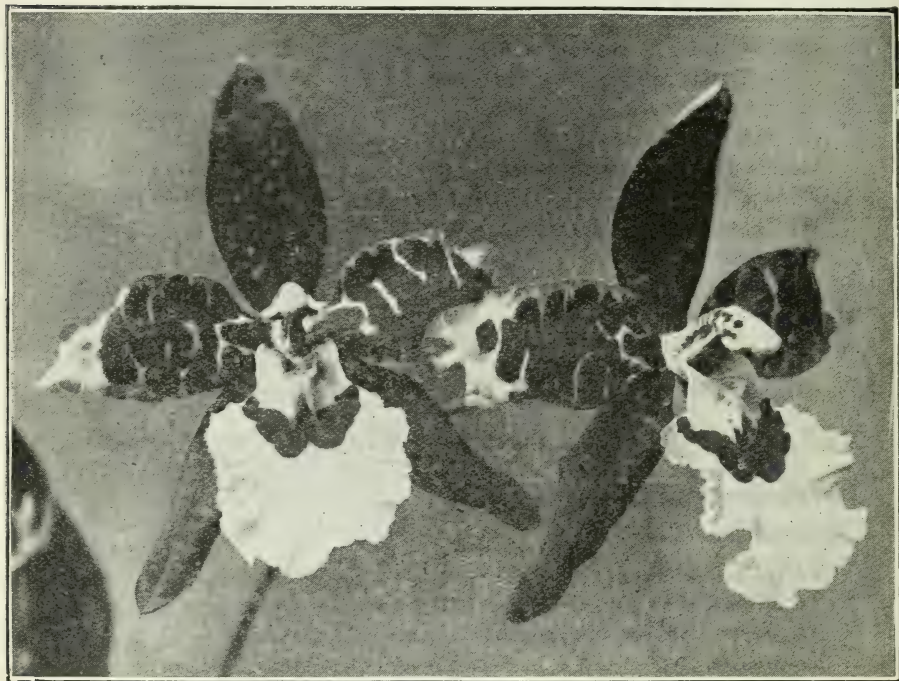


FIG. 34.—*ODONTOGLOSSUM* × 'THEODORA.' (*Gardeners' Chronicle*.)  
(p. lxxiii.)

unanimous), from Messrs. Sander, St. Albans. Flowers large and almost circular in form; white with violet tinge at the bases of the petals. Lip white with some red lines at the base.

To *Epilaelia* × *Lionetii* (*E. atropurpureum* × *L. purpurata*) (votes, 14 for, 2 against), from Messrs. Charlesworth, Hayward's Heath. Flowers singly on an erect stem, rose colour.

#### *Botanical Certificate.*

To *Pleurothallis Dirchenallii*, from Messrs. Charlesworth. Allied to *P. Scapha*. Sepals long, purple; petals linear, white.

To *Oncidium barbauium*, from Gurney Wilson, Esq., Haywards. Sepals and petals yellow barred with light brown; lip yellow, with a bearded margin to the side lobes.

*Cultural Commendation.*

To Mr. H. G. Alexander, Orchid grower to Lieut.-Col. G. L. Holford, C.I.E., C.V.O., for a fine specimen of *Odontoglossum Pescatorei*, with three spikes bearing 153 flowers.

To Mr. H. G. Alexander, for *Cattleya* × 'Enid,' with seven flowers on a spike.

To Mr. W. H. White, Orchid grower to Sir Trevor Lawrence, Bart., K.C.V.O., for three finely flowered *Dendrobium crepidatum*.

• **Other Exhibits.**

Lieut.-Col. G. L. Holford : hybrid Orchids.

Sir Trevor Lawrence, Bart : Masdevallias.

The Duke of Marlborough : *Odontoglossums*.

Norman C. Cookson, Esq. : *Odontoglossums*.

de B. Crawshay, Esq. : hybrid *Odontoglossums*.

ESTABLISHED  
1804.



INCORPORATED  
1809.

TELEGRAMS:  
"HORTENSIA, LONDON."

TELEPHONE:  
5363 WESTMINSTER

# ROYAL HORTICULTURAL SOCIETY,

VINCENT SQUARE, WESTMINSTER, S.W.

## NOTICES TO FELLOWS.

- |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
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| <ol style="list-style-type: none"><li>1. General.</li><li>2. Letters.</li><li>3. Telephone and Telegrams.</li><li>4. Journals Wanted.</li><li>5. Subscriptions.</li><li>6. Form of Bequest.</li><li>7. Privileges of Chemical Analysis.</li><li>8. List of Fellows.</li><li>9. New Fellows.</li><li>10. An Appeal.</li><li>11. Abstracts for Journal.</li><li>12. The Society's Gardens at Wisley.</li><li>13. Trials at Wisley in 1909-10.</li><li>14. The Wisley Research Station.</li><li>15. Students at Wisley.</li><li>16. Distribution of Surplus Plants.</li><li>17. Letting of the Society's Hall.</li><li>18. Exhibitions, Meetings, and Lectures in 1909.</li><li>19. Error in Fellows' Tickets.</li><li>20. British-grown Fruit.</li></ol> | <ol style="list-style-type: none"><li>21. Affiliated Societies' Challenge Cup.</li><li>22. "Book of Schedules."</li><li>23. Bottled British Fruits, &amp;c., Show.</li><li>24. Colonial-grown Fruit Show, 1909.</li><li>25. Shows of kindred Societies in 1909.</li><li>26. Special Prizes, 1909 and 1910.</li><li>27. Lectures.</li><li>28. "The Masters' Lectures."</li><li>29. Examinations, 1910</li><li>30. Information.</li><li>31. Inspection of Fellows' Gardens.</li><li>32. Affiliation of Local Societies.</li><li>33. Union of Horticultural Mutual Improvement Societies.</li><li>34. Colour Chart.</li><li>35. Monograph on Fungoid Pests.</li><li>36. Rules for Judging, 1909 Code.</li><li>37. Varieties of Fruits.</li><li>38. International Horticultural Exhibition, 1911.</li><li>39. Advertisements.</li></ol> |
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### 1. GENERAL.

Notices to Fellows are always added at the end of each number of the JOURNAL, immediately preceding the Advertisements; also at the beginning both of the "Book of Arrangements" and of the "Report of the Council." Fellows are particularly requested to consult these Notices, as it would often save them and the Secretary much unnecessary correspondence.



## 2. LETTERS.

All letters on *all* subjects should be addressed—The Secretary, Royal Horticultural Hall, Vincent Square, Westminster, S.W.

## 3. TELEPHONE AND TELEGRAMS.

Telephone Number : **5363 WESTMINSTER.**

“**HORTENSIA, LONDON,**” is sufficient address for telegrams.

## 4. JOURNALS WANTED.

The Secretary would be greatly obliged by the return to the Society of ANY NUMBERS of the JOURNAL which may be of no further use to Fellows. Complete sets are occasionally applied for, but, at the present moment, not even one can be supplied owing to the stock of the following being exhausted :—

VOLUME X.

VOLUME XIII. Part 1.

These are therefore particularly asked for.

## 5. SUBSCRIPTIONS.

All Subscriptions fall due on January 1st of each year. To avoid the inconvenience of remembering this, Fellows can *compound* by the payment of one lump sum in lieu of all further annual payments ; or they can, by applying to the Society, obtain a form of instruction to their bankers to pay for them every January 1st. It may be a week or more before the Tickets reach the Fellow, owing to the very large numbers, over 20,000, having to be despatched within the first month of the year. Fellows who have not already given an order on their bankers for the payment of their subscriptions each year are requested to do so, as this method of payment is preferred, and saves the Fellows considerable trouble. Forms for the purpose may be obtained from the R.H.S. Offices at Vincent Square, Westminster, S.W. Fellows whose subscriptions remain unpaid are debarred from all the privileges of the Society ; but their subscriptions are nevertheless recoverable at law, the Society being incorporated by Royal Charter.

In paying their subscriptions, Fellows often make the mistake of drawing their cheques for Pounds instead of for Guineas. Kindly note that in all cases it is Guineas, and not Pounds. Cheques and Postal Orders should be made payable to “The Royal Horticultural Society” and crossed “London and County Bank, Westminster.”

## 6. FORM OF BEQUEST.

I give and bequeath to the Treasurer for the time being of the Royal Horticultural Society, London, the sum of £ ....., to be paid out of

such part of my personal estate as I can lawfully charge with the payment of such legacy, and to be paid free of legacy duty, within six months of my decease; the receipt of such Treasurer to be a sufficient discharge for the same. And I declare that the said legacy shall be applied towards [the general purposes of the Society].\*

## 7. PRIVILEGES OF CHEMICAL ANALYSIS.

Instructions are contained at page 74 in the "Book of Arrangements," 1909.

## 8. LIST OF FELLOWS.

A list of all the Fellows of the Society is sent out in January. Fellows are requested to look at their own names in it, and if in any way these are incorrect, or the addresses insufficient, they are requested to inform the Secretary at once. Forms of Nomination, and of the Privileges of Fellows, are bound in with every number of the JOURNAL and the "Book of Arrangements."

## 9. NEW FELLOWS.

The President and Council fully appreciate how much the prosperity of the Society and its present large number of Fellows is due to the efforts of Fellows to enlist the sympathy of their friends; and the steady advance during recent years indicates the increasing recognition of the Society's work and usefulness. But it must not be supposed that a maximum has yet been reached. There is ample room for a great increase of Fellows, in the North of England especially, as well as in America and the Colonies.

## 10. AN APPEAL.

What has been accomplished for the Society since 1887 is largely due to the unwearied assistance afforded by a small proportion of the Fellows; but as all belong to the same Society, so it behoves each one to do what he or she can to further its interests, especially in:—

1. Increasing the number of Fellows.
2. Helping to swell the General Prize Fund started by Mr. A. W. Sutton, V.M.H., for providing Prizes for the Students at Wisley; and also the special Nicholson Memorial Prize Fund.
3. Lectures with lantern slides.
4. Books are required to fill the gaps in the Library both at Vincent Square and at Wisley.
5. New and rare Plants and Seeds are wanted for the Garden and surplus roots for distribution to the Fellows.
6. Assisting in making Abstracts for the JOURNAL.

Thus there is plenty for all to do according to their individual liking: personal effort, money, plants, books, are all alike needed. The Secretary,

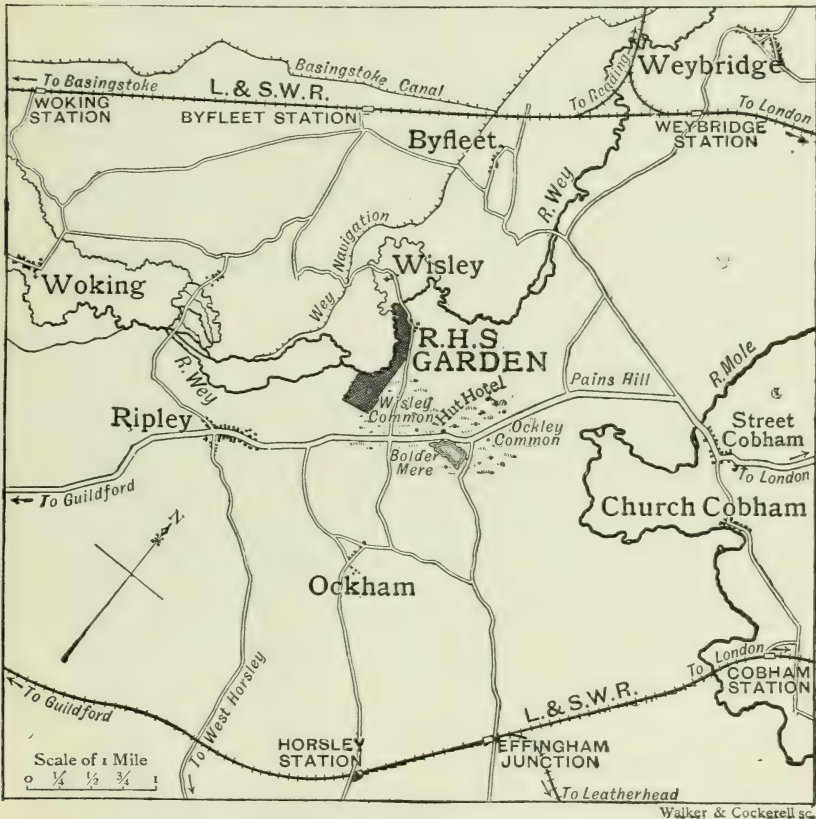
\* Any special directions or conditions which the testator may wish to be attached to the bequest may be substituted for the words in brackets.

therefore, asks those who read these lines to do their best to help in any of the ways above indicated.

Since this paragraph last appeared a magnificent collection of Orchids has been given to the Society by Mr. J. W. Field, and a valuable binocular microscope by Mr. C. G. A. Nix—both gifts being most acceptable.

## 11. ABSTRACTS FOR JOURNAL.

Fellows (especially those who are interested in any of the numerous ways in which modern scientific researches affect Horticulture or Botany) will long ago have recognized the value of the ABSTRACTS from current periodical literature which appear in each issue of the JOURNAL. In order to keep these abstracts up to date, we are greatly in want of a few more volunteers to help in the work. The Periodicals are sent from the office to the Fellow undertaking to Abstract, and the return postage expenses are prepaid. Any Fellow willing to help in this way is requested to send name and address to the Secretary.



POSITION OF THE SOCIETY'S GARDENS

## 12. THE SOCIETY'S GARDENS AT WISLEY.

The Gardens are open daily to Fellows and others showing Fellows' Transferable Tickets from 9 A.M. till sunset, except on Sundays, Good



Friday, Christmas Day, and Exhibition days. Each Fellow's ticket admits three to the Gardens. The Public are not admitted.

The Gardens, situated at Wisley (about 2 miles from Ripley, in Surrey), are about 3 miles from Byfleet,  $3\frac{1}{2}$  miles from Horsley, and  $5\frac{1}{2}$  miles from Weybridge, all stations on the South-Western Railway, with frequent trains from Waterloo and Clapham Junction. Carriages to convey four persons can be obtained by writing to Mr. D. White, fly proprietor, Ripley, Surrey; the charge being, to and from Weybridge, waiting two hours at the Gardens, 8s.; or waiting three hours, 10s.; or to and from Horsley, 7s.; Effingham Junction, 7s.; Byfleet, 7s. Visitors should in all cases be careful to state the trains they intend to arrive by and leave by. Carriages can also be obtained at Weybridge for 8s. by writing to Mr. Trembling, New Road, Weybridge. Excellent accommodation and refreshments can be had at the Hut Hotel, close to the Gardens, and also at the Hautboy at Ockham.

### 13. TRIALS AT WISLEY IN 1909-10.

Trials of the following Fruits, Flowers, and Vegetables at the Wisley Gardens during 1909 have been arranged.

N.B.—Everything sent for trial *must be named*, and the name and address of the Sender attached.

*Fruits*.—Autumnal Raspberries. 15 Canes of each variety to be sent at once.

*Flowers*.—Tree Carnations. 4 plants of each variety to be sent in February, 2 for out-, 2 for in-doors.

Annuals. Seed to be sent in January.

Garden Dahlias, Show and Cactus excluded. 2 plants of each variety to be sent in April.

Early-flowering outdoor Chrysanthemums. 2 plants of each variety to be sent in April.

Pentstemons. 2 plants of each variety to be sent in April or seed in January.

*Vegetables*.—Potatos; each variety must be labelled as being "early," "mid-season," or "late." 20 tubers of each to be sent by February. Also experiments with one variety—viz. "The Factor" (20 tubers)—secured from as many varying sources as possible, under different soil and climatic conditions. Please send particulars of soil and climate.

Cauliflower.  $\frac{1}{4}$  oz. of each variety.

Lettuce.  $\frac{1}{4}$  oz. of each variety.

Kidney Beans.  $\frac{1}{2}$  pint of each variety.

All parcels should be addressed:—

If sent by post: The Superintendent, R.H.S. Gardens, Wisley, Ripley, Surrey.

If by rail: The Superintendent, R.H.S. Gardens, Wisley, Horsley Station, L. & S.-W.R., with advice by post to the Superintendent.

### SEEDS SENT FOR TRIAL OTHER THAN THOSE INVITED IN THE ABOVE LIST.

1. Seeds, &c., of plants not included in the Annual Trial List will also be received and grown, as far as possible.

2. The Superintendent is instructed, in the case of all seeds thus sent and grown, to procure seeds of the already best existing similar varieties, and grow them alongside of the newly sent seeds.

3. The resulting plants, &c., will be from time to time (as convenient) submitted to the Committee meeting at Wisley, but the only awards made to such unsolicited plants will be "Commended" and "Highly Commended."

4. Any plants thus grown and tried will have perfect freedom to be retied whenever a regular fixed trial of their congeners takes place, which will, as far as practicable, be at intervals of two or three years.

## 14. THE WISLEY RESEARCH STATION.

The new Research Station and Laboratory at Wisley is now completed and work is in progress there. Mr. F. J. Chittenden, F.L.S., has been appointed Director of the Research Work on Scientific Matters affecting Practical Horticulture, and Lecturer to the Students. By the completion of this station a long-felt want has been met. In the United States, where so much good work has been done in this direction, all is paid for by the Government, but in this country we have to fall back on private individuals or on Societies.

## 15. STUDENTS AT WISLEY.

The Society admits young men, under 22 years of age, to study Gardening at Wisley. The curriculum now includes not only practical garden work in all the main branches of Horticulture, but also lectures, demonstrations, and elementary Horticultural Science in the Laboratory, whereby a practical knowledge of simple Garden Chemistry, Biology, &c., may be obtained. The Laboratory is equipped with the best apparatus procurable for Students. The training extends over a period of two years, with a progressive course for each year. Students can only enter at the end of September and at the end of March. Selected Students have also the advantage of attending certain of the Society's Shows and Lectures in London.

## 16. DISTRIBUTION OF SURPLUS PLANTS.

In a recent Report the Council drew attention to the way in which the annual distribution of surplus plants has arisen. In a large garden there must always be a great deal of surplus stock, which must either

be given away or go to the waste heap. A few Fellows, noticing this, asked for plants which would otherwise be discarded; and they valued what was so obtained. Others hearing of it asked for a share, until the Council felt they must either systematize this haphazard distribution or else put a stop to it altogether. To take the latter step seemed undesirable. Why should not such Fellows have them as cared to receive such surplus plants? It was therefore decided to keep all plants till the early spring, and then give all Fellows alike the option of claiming a share of them by ballot.

Fellows are therefore particularly requested to notice that only waste and surplus plants raised from seeds or cuttings are available for distribution. Many of them may be of very little intrinsic value, and it is only to avoid their being absolutely wasted that the distribution was established. The great majority also are of necessity *very small*, and may require careful treatment for a time.

Fellows are particularly requested to note that a Form of Application and list to choose from of the plants available for distribution is sent in January *every year* to every Fellow, enclosed in the "Report of the Council." To avoid all possibility of favour, all application lists are kept until the last day of February, when they are all thrown into a Ballot; and as the lists are drawn out, so is the order of their execution, the plants being despatched as quickly as possible after March 1.

Of some of the varieties enumerated the stock is small, perhaps not more than twenty-five or fifty plants being available. It is therefore obvious that when the Ballot is kind to any Fellow he will receive all the plants exactly as he has selected, but when the Ballot has given him an unfavourable place he may find the stock of the majority of plants he has chosen exhausted. A little consideration would show that all Fellows cannot be first, and some must be last, in the Ballot. Application forms received after March 1 and before April 30 are kept till all those previously received have been dealt with, and are then balloted in a similar way. Fellows having omitted to fill up their application form before April 30 must be content to wait till the next year's distribution. The work of the Gardens cannot be disorganized by the sending-out of plants at any later time in the year. All Fellows can participate in the annual distribution *following* their election.

The Society does not pay the cost of packing and carriage. The charge for this will be collected by the carriers on delivery of the plants, which will be addressed exactly as given by each Fellow on his application form. It is impracticable to send plants by post, owing to the lack of Post Office facilities for despatch without prepayment of postage.

Fellows residing beyond a radius of thirty-five miles from London are permitted to choose double the number of plants to which they are otherwise entitled.

Plants cannot be sent to Fellows residing outside the United Kingdom, owing either to length of time in transit or to vexatious regulations in some foreign countries; but the Council will at any time endeavour to obtain for Fellows living abroad any unusual or rare seeds which they may have been unable to procure in their own country.



## 17. LETTING OF THE SOCIETY'S HALL.

The Royal Horticultural Hall and Offices are situated in Vincent Square, which lies straight through Ashley Gardens from Victoria Street,



POSITION OF THE SOCIETY'S HALL.

Westminster, and is about five minutes' walk from the Victoria and St. James's Park Stations.

Fellows are earnestly requested to make known among their friends and among other institutions that the ROYAL HORTICULTURAL HALL is available for Meetings, Shows, Exhibitions, Concerts, Conferences, Lectures, Balls, Banquets, Bazaars, Receptions, and other similar purposes. The Hall has a floor surface of 13,000 square feet. It is cool in summer and warm in winter. For a Concert it will seat 1,500, or for a public meeting 1,800. A Sound Board has recently been added, by which the acoustic properties are very greatly improved. It is undoubtedly the lightest Hall in London. The first floor, consisting of four rooms, may also be hired for similar purposes, either together or separately. A long-felt want has now been met by the construction of a convenient kitchen in the basement, with lift connections to the eastern annexe and lecture room. For serving luncheons, &c., this will prove a great boon. Ample cloak-rooms for ladies and for gentlemen are available. The regulations, &c., for hiring the Hall are printed in the "Book of Arrangements," and full particulars may be obtained on application to the Secretary, R.H.S., Vincent Square, Westminster, S.W., with whom dates may be booked.

## 18. EXHIBITIONS, MEETINGS, AND LECTURES IN 1909.

The programme will be found in the "Book of Arrangements" for 1909, issued at the end of January. It will be noticed that an

Exhibition and Meeting is held practically every fortnight throughout the year, and a short lecture on some subject connected with Horticulture is delivered during the afternoon.

A reminder of every Show will be sent in the week preceding to any Fellow who will send to the R.H.S. Offices, Vincent Square, S.W., a sufficient number (32) of halfpenny cards *ready addressed* to himself.

## 19. ERROR IN FELLOWS' TICKETS.

The entry of a Show on December 21 which appears on the Fellows' Tickets is an error. There will be no Show on that date, as it is found to be too near to Christmas.

## 20. BRITISH-GROWN FRUIT.

In consideration of the facts (1) that the annual Autumn Show of British-grown Fruits is every year practically a repetition of that of the previous year; (2) that many British-grown fruits cannot be shown in perfection at one Show; and (3) that vegetables have been somewhat neglected, the Council have decided to omit the great Autumn Show for one year, and in 1909 to substitute a series of prizes spread over twelve months, so that every fruit may have a chance of being seen at its best. A schedule of prizes will be found in the "Book of Arrangements" for 1909, and also in "The Book of Schedules" (see below).

## 21. AFFILIATED SOCIETIES' CHALLENGE CUP.

The Council offer a Challenge Cup to be competed for annually by the Affiliated Societies, subject to certain conditions (for which see "The Book of Schedules," 1909, price 6d.). The winners will hold the Cup for one year, and will also receive a Silver-gilt Knightian Medal, together with a set of their Publications and Charts presented to the Society by the Worshipful Company of Fruiterers.

## 22. "BOOK OF SCHEDULES."

The 1909 "Book of Schedules," containing revised Rules and Regulations for Exhibitors, &c., and full details of the Temple, Holland House, Colonial Fruit, and Bottled Fruit Shows, and a complete Schedule with Regulations for the Special Fruit and Vegetable Competitions at the Fortnightly Meetings, was issued on Thursday, February 25, price 6d., and on receipt of this amount a copy will be forwarded by post immediately.

## 23. BOTTLED BRITISH FRUITS, &c., SHOW.

The Annual Exhibition of British Bottled Fruits will be held on December 1 to 4, 1909. Prizes and Medals are offered. See "Book of Schedules," 1909, issued on Thursday, February 25, post free, 6d.

## 24. COLONIAL-GROWN FRUIT SHOW, 1909.

An Exhibition of Colonial-grown Fruits and Vegetables will be held on December 1 to 4, 1909.

In holding this Show the Society's sole object is the advancement of the interest of the Colonies (*a*) by stimulating the production of better fruits ; (*b*) by giving advice in the difficulties confronting Fruit Growers ; and (*c*) by helping to inform the home market. Fruit Growers in the Colonies are asked to assist their own future competition in the markets of Great Britain by sending exhibits to this Exhibition, invitations to which are given to the Colonial and Government Offices, the Embassies, the leading London Fruit Merchants, Colonials on furlough, and others.

Particulars of the Show will be found in the "Book of Schedules" for 1909, issued on February 25, price 6d., post free.

## 25. SHOWS OF KINDRED SOCIETIES IN 1909.

The following dates have been fixed, on which R.H.S. Fellows' tickets will admit :—

March 24.—Perpetual Flowering Carnation Society.

April 20.—Auricula and Primula Society.

May 18.—Tulip Society.

July 21.—Carnation and Picotee Society.

July 23.—Sweet Pea Society.

September 16.—Rose Society.

December 8.—Perpetual Flowering Carnation Society.

Copies of the Schedules for these Shows may be obtained from the Honorary Secretary of each Society. For names and addresses see above dates in the "Book of Arrangements," 1909.

## 26. SPECIAL PRIZES, JULY-DECEMBER, 1909 AND 1910.

(1) CHALLENGE CUP FOR AFFILIATED SOCIETIES. (See p. lxxxiv.)

(2) APPLES AND PEARS.

The Worshipful Company of Fruiterers have presented the following prizes, which the Council have accepted and propose to award as follows :—

*On October 12* : a set of Publications with Charts and Handbook for the Affiliated Societies. (See "Book of Schedules.")

*November 23* : the Company's medals for (*a*) three dishes of Dessert and six of Cooking Apples, distinct ; and for (*b*) seven dishes of Dessert and two of Cooking Pears, distinct. (See "Book of Schedules.")

(3) HOME-BOTTLED FRUITS.

The Council have accepted the offer of a Mercia Sterilizer from Miss Edith Bradley for award at the Show of Home-Bottled Fruits to be held on December 1 to 4, 1909. (See "Book of Schedules," post free, 6d.)



# SPECIAL PRIZES, 1910.

## (4) APPLE 'ENCORE.'

Messrs. Cheal have intimated their willingness to present to the Society a series of seven prizes for a dish of the new Apple 'Encore,' to be awarded at the great Autumn Show of British-grown Fruits in October 1910. First, 20s.; second, 17s. 6d.; third, 15s.; fourth, 12s. 6d.; fifth, 10s.; sixth, 7s. 6d.; seventh, 5s.

## (5) FORCED HYACINTHS.

The Council of the Royal Horticultural Society have accepted the offer of the following prizes from the General Bulb Growers' Society at Haarlem, to be competed for in March 1910:—

### *Division I.—For Amateurs and Gentlemen's Gardeners.*

#### Class 3.—Eighteen Hyacinths, distinct.

|                 |        |                 |        |
|-----------------|--------|-----------------|--------|
| 1st Prize . . . | £6 6s. | 4th Prize . . . | £3 3s. |
| 2nd „ . . .     | £5 5s. | 5th „ . . .     | £2 2s. |
| 3rd „ . . .     | £4 4s. | 6th „ . . .     | £1 1s. |

#### Class 4.—Twelve Hyacinths, distinct.

|                 |        |                 |        |
|-----------------|--------|-----------------|--------|
| 1st Prize . . . | £5 5s. | 4th Prize . . . | £2 2s. |
| 2nd „ . . .     | £4 4s. | 5th „ . . .     | £1 1s. |
| 3rd „ . . .     | £3 3s. |                 |        |

#### Class 5.—Six Hyacinths, distinct.

|                 |         |                 |         |
|-----------------|---------|-----------------|---------|
| 1st Prize . . . | £2 2s.  | 3rd Prize . . . | £1 1s.  |
| 2nd „ . . .     | £1 10s. | 4th „ . . .     | £0 10s. |

Class 6.—Four pans containing Hyacinths, ten roots of one variety in each pan. The blooms of each pan to be of distinctly different colour to those of the other three pans.

|                 |        |                 |        |
|-----------------|--------|-----------------|--------|
| 1st Prize . . . | £4 4s. | 3rd Prize . . . | £2 2s. |
| 2nd „ . . .     | £3 3s. | 4th „ . . .     | £1 1s. |

### *Division II.—For Trade Growers.*

Class 7.—Collection of 200 Hyacinths, in at least 36 varieties, grown in pots or glasses.

Prize. The Gold Medal of the General Bulb Growers' Society at Haarlem.

Class 8.—Collection of 200 Hyacinths, in 20 varieties, in pans; 10 roots of one variety in each pan.

Prize. The Gold Medal of the General Bulb Growers' Society at Haarlem.

*Regulations.*—For Classes 3, 4, and 5, each bulb must be in a separate pot (size optional). Classes 3, 4, 5, and 6 must all be single spikes; no

spikes may be tied together. Exhibitors may only compete in one of the Classes numbered 3, 4, and 5.

All the bulbs must have been forced entirely in Great Britain or Ireland.

## 27. LECTURES.

The new Lecture Room is fitted with an electric lantern of the most modern construction; electric current, gas, and water are laid on, and every provision has been made for the illustration and delivery of Lectures.

Any Fellows willing to Lecture, or to communicate Papers on interesting subjects, are requested to communicate with the Secretary.

## 28. "THE MASTERS LECTURES."

Fellows will remember the intimate connection with the Society of the late Dr. Masters, F.R.S., who did much for horticulture by drawing constant attention to the various ways in which scientific discovery and research might be made serviceable to gardening; and it will also be remembered that a fund was established by subscriptions to perpetuate his memory in connection with the Society and to carry on in some degree his work of science in relation to gardening.

"The Masters Lectures" have accordingly been founded, and the first two are to be given during 1909 by the well-known Professor Hugo de Vries, of Amsterdam, on (a) "Masters' 'Vegetable Teratology,'" Sir Trevor Lawrence, Bart., K.C.V.O., V.M.H., in the Chair (June 22), and (b) "The Production of Horticultural Varieties," Chairman Professor W. Bateson, F.R.S., V.M.H. (September 28).

In 1910 Mr. A. D. Hall, M.A., F.R.S., will be the Masters Lecturer.

## 29. EXAMINATIONS, 1910.

1. The Annual Examination in the Principles and Practice of Horticulture will be held on Wednesday, April 20, 1910. The examination has two divisions, viz. (a) for Candidates of eighteen years of age and over, and (b) for Juniors *under* eighteen years. Candidates should send in their names not later than March 30. Full particulars may be obtained by sending a stamped and directed envelope to the Society's Offices. Copies of the Questions set from 1893 to 1909 (price 2s. post free) may also be obtained from the Office. The Society is willing to hold an examination wherever a magistrate, clergyman, schoolmaster, or other responsible person accustomed to examinations will consent to supervise one on the Society's behalf.

The Society is prepared to extend this examination to residents in the Colonies; and, at the request of the Government of the United Provinces of India, this test was held in 1909—altered and adapted to the special requirements of India—at Saharanpur and Calcutta.

In connection with this examination a Scholarship of £25 a year for two years is offered by the Worshipful Company of Gardeners, to be

awarded after the 1910 examination to the student who shall pass highest, if he is willing to accept the conditions attaching thereto. The main outline of these conditions is that the holder must be of the male sex, and between the ages of 18 and 22 years, and that he should study gardening for one year at least at the Society's Gardens at Wisley, conforming to the general rules laid down there for Students. In the second year of the Scholarship he may, if he like, continue his studies at some other place at home or abroad which is approved by the Council of the Society. In case of two or more eligible Students being adjudged equal, the Council reserve to themselves the right to decide which of them shall be presented to the Scholarship.

2. The Society will hold an Examination in Cottage Gardening on Wednesday, April 27, 1910. This examination is intended for, and is confined to, Elementary and Technical School Teachers. It is undertaken in view of the increasing demand in country districts that the Schoolmaster shall be competent to teach the elements of Cottage Gardening, and the absence of any test of such competence. The general conduct of this examination will be on similar lines to that of the more general examination. Questions on Elementary Chemistry and Biology are now added to this examination.

3. The Society will hold an examination in the Royal Horticultural Hall, Vincent Square, S.W., on Monday, January 10, 1910, for gardeners employed in Public Parks and Gardens belonging to County Councils, City Corporations, and similar bodies. The entries close on January 1, 1910.

Medals and Certificates are awarded and Class Lists published in connection with these examinations, and the Syllabus may be obtained on application to the Secretary R.H.S., Vincent Square.

### 30. INFORMATION.

Fellows may obtain information and advice from the Society as to the names of flowers and fruit, on points of practice, insect and fungoid attacks, and other questions by applying to the Secretary R.H.S., Vincent Square, Westminster, S.W. Where at all practicable it is particularly requested that letters and specimens may be timed to reach Vincent Square by the first post on the mornings of the Fortnightly Meetings, so as to be laid before the Scientific or other Committees at once.

### 31. INSPECTION OF FELLOWS' GARDENS.

The Inspection of Gardens belonging to Fellows is conducted by a thoroughly competent Inspector from the Society, who reports and advises at the following cost, viz. a fee of £3 3s. for one day (or £5 5s. for two consecutive days), together with all out-of-pocket expenses. No inspection may occupy more than two days, save by special arrangement. Fellows wishing for the services of an Inspector are requested to give at least a week's notice and choice of two or three days, and to indicate the most convenient railway station and its distance from their gardens. Gardens can only be inspected at the *written* request of the owner.



### 32. AFFILIATION OF LOCAL SOCIETIES.

One of the most successful of the many new branches of work undertaken since the reconstruction of the Society in 1887 is the unification of local Horticultural Societies by a scheme of affiliation to the R.H.S. Since this was initiated no fewer than 200 Societies have joined our ranks, and the number is steadily increasing.

The Parent Society is this year offering a Silver Challenge Cup to be competed for by Affiliated Societies. (See "Book of Schedules," price 6*d.*, under date October 12.)

To the privileges of Affiliated Societies have been added all the benefits accruing under the scheme recently introduced for the Union of Horticultural Mutual Improvement Societies.

Secretaries of Affiliated Societies can obtain on application a specimen of a Card which the Council have prepared for the use of Affiliated Societies for Certificates, Commendations, &c. Price 3*s.* 6*d.* for 10 copies, 5*s.* 6*d.* for 20, 11*s.* 6*d.* for 50, 20*s.* for 100.

The Council have also struck a special Medal for the use of Affiliated Societies. It is issued at cost price in Bronze, Silver, and Silver-gilt—viz. Bronze, 5*s.* 6*d.*, with case complete; Silver, 12*s.* 6*d.*, with case complete; Silver-gilt, 16*s.* 6*d.*, with case complete. Award Cards having the Medal embossed in relief can be sent with the Medal if ordered, price 6*d.* each.

### 33. UNION OF HORTICULTURAL MUTUAL IMPROVEMENT SOCIETIES.

This Union has been established for the encouragement and assistance of Horticultural Mutual Improvement Societies, the object being to strengthen existing Societies, to promote interchange of lecturers, to provide printed lectures, and if possible to increase the number of these useful Societies.

A list of lecturers and their subjects, and also a list of typewritten lectures, with or without lantern slides, prepared by the Society, may be obtained from the Secretary R.H.S., price 3*d.*

The Secretary will be glad to hear from lecturers who are willing to lecture to such Societies, that he may enroll them in the Register of Lecturers and bring them into touch with Societies requiring assistance. Others may like to send to him written lectures (with or without lantern slides), that he may have them printed for circulation among these Societies.

Lantern slides on horticultural topics are urgently needed, and their gift will be very much appreciated.

The annual Meeting of the Delegates will be held at 4 P.M. on October 12.

### 34. COLOUR CHART.

Hardly a gardener or florist exists who has not at times longed for a COLOUR CHART—that is to say, for a standard of reference whereby he could himself name, or recognize, or convey to a friend at a distance, the *exact* shade of colour of a flower he desired to procure or had seen advertised, or wished to commend to a friend. Take, for example, the word “crimson”; what a multitude of colours and shades it may be made to include! Some, very beautiful; some, horrible concoctions of red and blue crudely combined.

The Council of the Society have long felt the need of such a Colour Chart, but the huge expense of production has hitherto deterred them from issuing it.

Not long since an admirable chart, containing more than 1,450 shades of colour between white and black, was published at the instance of the French Chrysanthemum Society, the price being £1 1s. net, and by it it is now possible to *exactly* recognize or describe to a friend or purchaser at a distance the precise colour of any possible flower. You may have met with an Azalea, for instance, which greatly strikes your fancy; you take out your Chart and match its shade, and describe it to your friend or your nurseryman as, “Colour: Apricot, p. 53, shade 3,” and he turns to his Chart and sees *exactly* what it is you want or describe. Or you want to make someone understand the exact shade of a rose in the way of “Andersoni,” and you need only say, “Rosy pink, p. 118, shade 4,” and your correspondent turns to his Chart and sees in a moment exactly what it is you want to describe. Or a nurseryman, having raised a new variety, can by simply quoting “Colour Chart, p. —, shade —,” exactly represent to his customers the colour-beauty of his new introduction.

The Council recognizing both the excellence and the usefulness of this Chart, the idea at once occurred: Could it not be adopted as an International Standard, so that all lovers of flowers all over the world could accurately and exactly describe to one another (no matter how far away or speaking what language) the colour and shade of any particular flower they refer to? There seemed no other difficulty than the somewhat prohibitive cost of £1 1s. net. But difficulties only exist to be overcome, and by undertaking to be responsible for a very large number the Society is now in a position to offer this Chart to its Fellows at the reduced cost of 14s. 6d., for which price it can be obtained at the Society's Offices, Vincent Square, or it can be sent free by post for 15s.; but in all cases a cheque or postal order must be sent beforehand.

This Chart will, of course, be found vastly useful for many other purposes; for example, a lady wishing to match a certain shade has only to refer her dressmaker to such and such a colour on p. —, shade —, and it can be infallibly matched. An artist wishing to describe the colour of the sky on a certain sundown can do so exactly by reference to the Chart. And in many other like ways it must prove generally useful, containing as it does every possible shade of colour between black and white.

The Council hope that Fellows will avail themselves freely of this offer, as unless a very large number of copies are purchased a great loss will accrue to the Society.

### 35. MONOGRAPH ON FUNGOID PESTS.

The attention of Fellows is directed to a handsome volume published by the Society on "Fungoid Pests of Cultivated Plants," by Dr. M. C. Cooke, V.M.H. It consists of 280 pages of letterpress, and is illustrated with 24 coloured plates, containing figures of 360 different fungoid attacks, and 23 woodcuts. It also contains a Chapter on Fungicides, which explains clearly how to make the different washes and sprays, and gives the proportions in which the various ingredients should be used. The whole work is written so as to interest and instruct the cultivator in the simplest and most practical manner. The volume makes an admirable school prize or gift to a gardener or student of nature. Price 5s., R.H.S. Office, Vincent Square.

"No one whose plants are subject to fungoid attacks—and whose are not?—should be without this book; for not only can they by its use identify the disease at once, but they are also told both how to treat it and overcome it, and also how to make the different washes and sprays which the different classes of fungoid attacks require."

### 36. RULES FOR JUDGING—1909 CODE.

The "Rules for Judging, with Suggestions to Schedule Makers and Exhibitors," have again been further revised and considerably modified from the experience gained during the last few years. Special attention is drawn to the amended Rule defining "an amateur," with suggestions for establishing four distinct classes of amateurs to meet the requirements of larger or smaller local Societies. The "pointing" recommended for fruits and vegetables has also been considerably amended, and the terms "annuals" and "biennials" further explained. The secretaries of local Societies are advised to obtain a fresh copy. It will be sent post free on receipt of a postal order for 1s. 6d., addressed to the Secretary, Royal Horticultural Society, Vincent Square, Westminster, S.W.

### 37. VARIETIES OF FRUITS.

Many people plant Fruit trees without a thought of what Variety they shall plant, and as a result almost certain disappointment ensues, whilst for an expenditure of 2d. they can obtain from the Society a little 16-page pamphlet which contains the latest expert opinion on Apples, Pears, Plums, Cherries, Raspberries, Currants, Gooseberries, and Strawberries, together with Notes on Planting, Pruning, and Manuring, which for clearness of expression and direction it would be impossible to surpass. It has in fact been suggested that no other 16 pages in the English language contain so much and such definite information. At the end of the pamphlet are given the names of some of the newer varieties of Fruits, which promise well, but are not yet sufficiently proved to be recommended for general planting.



Copies of this pamphlet for distribution may be obtained at the Society's Office, Vincent Square, Westminster. Price, post free: single copy, 2d., or 25, 2s.; 50, 3s.; 100, 4s.

## 38. INTERNATIONAL HORTICULTURAL EXHIBITION.

1911.

### PRELIMINARY NOTICE.

The President and Council of the Royal Horticultural Society have decided to organise an INTERNATIONAL HORTICULTURAL EXHIBITION in London, in 1911 or 1912.

Definite dates and further particulars will be issued in the Autumn.

W. WILKS, *Secretary*.

*By order of the Council.*

## 39. ADVERTISEMENTS.

Fellows are reminded that the more they can place their orders with those who advertise in the Society's Publications the more likely others are to advertise also, and in this way the Society may be indirectly benefited.

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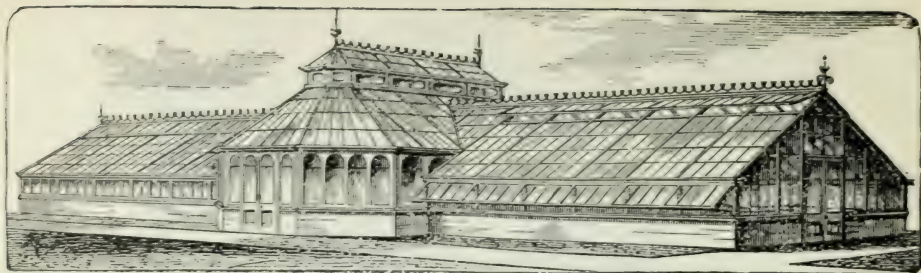
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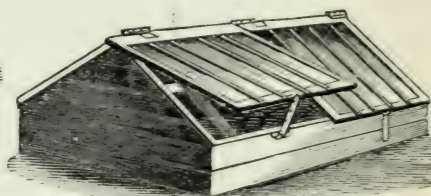
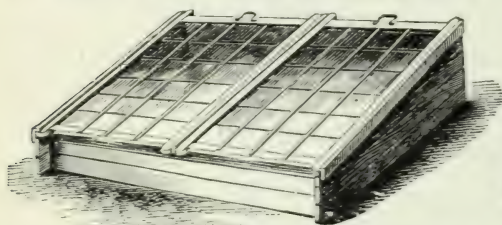
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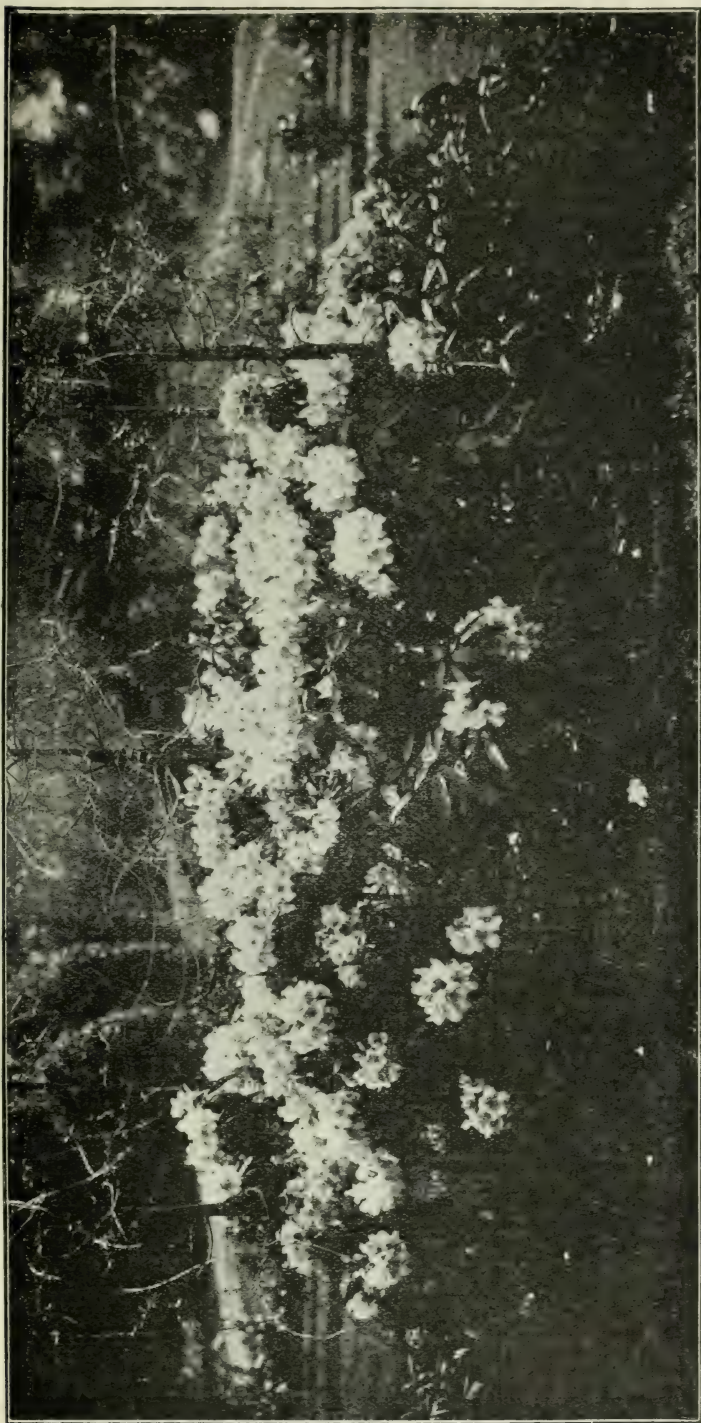
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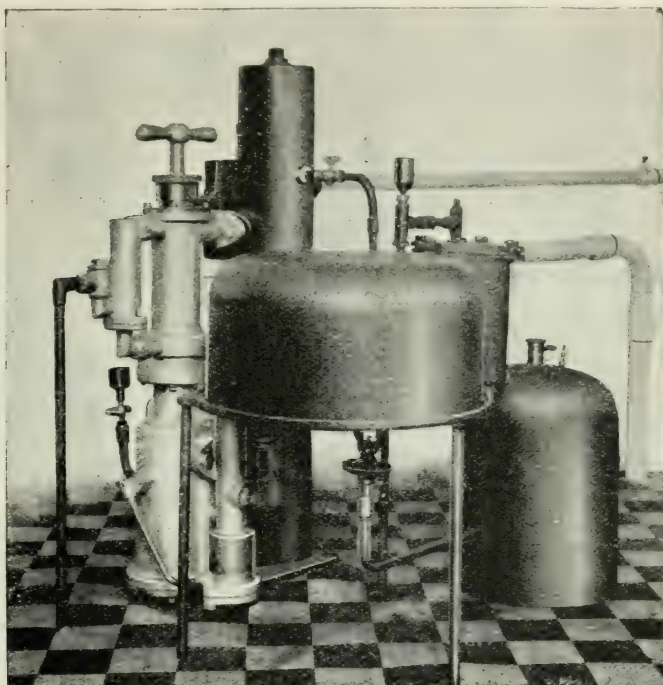
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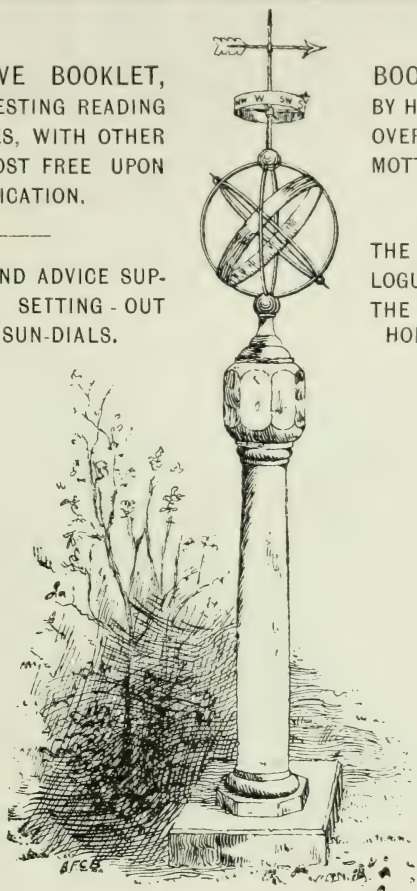
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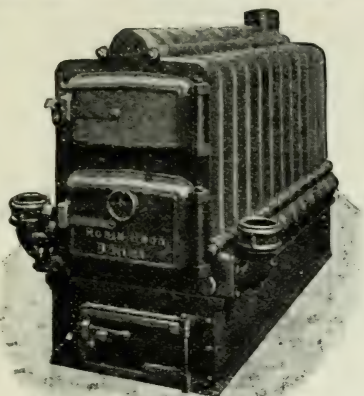
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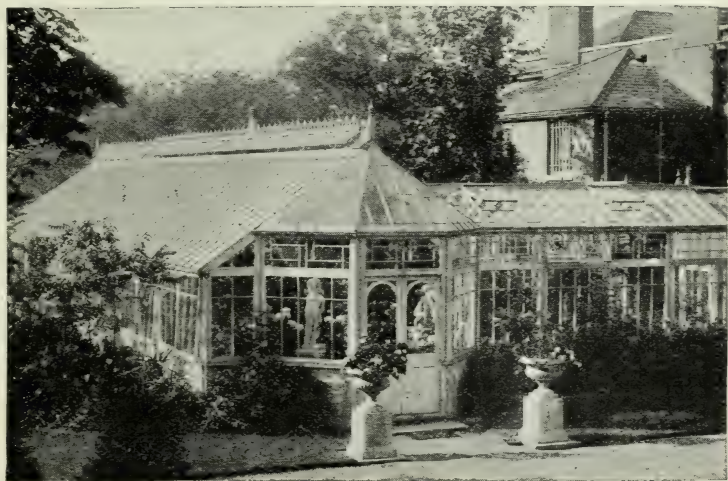
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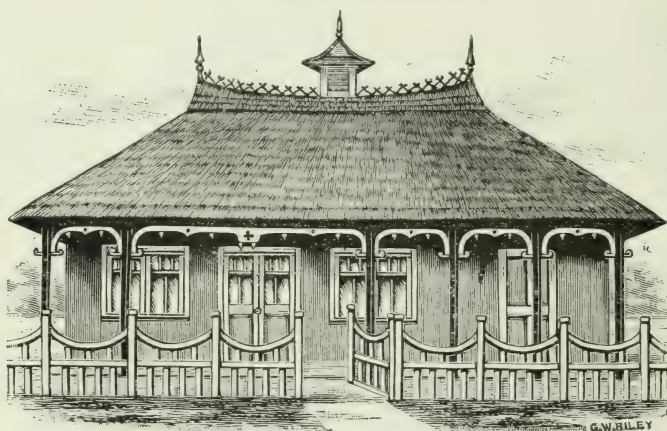


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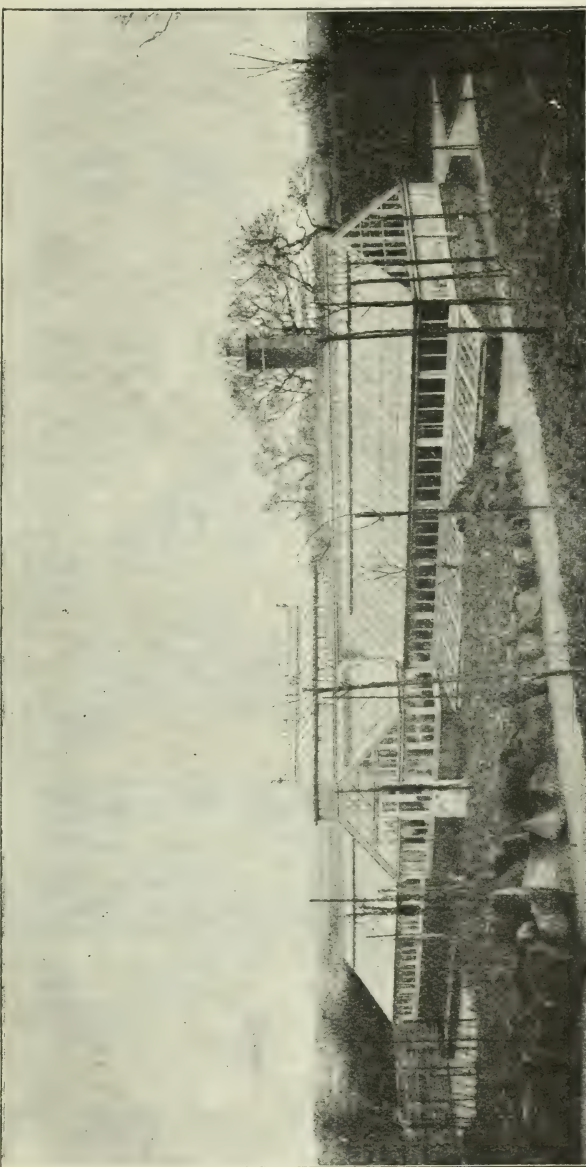
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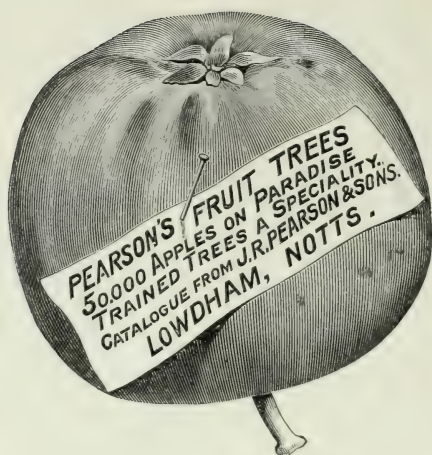
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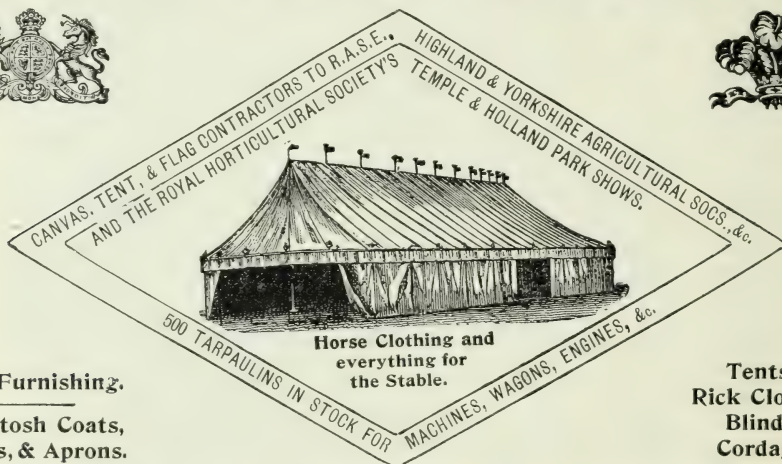




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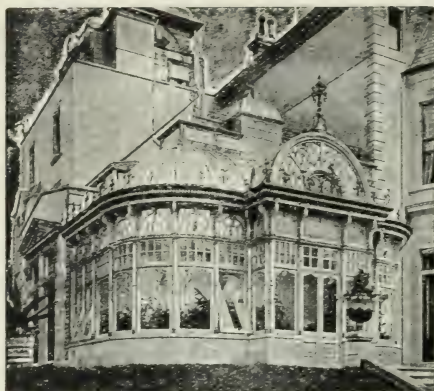
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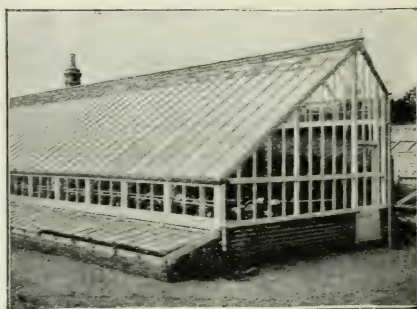
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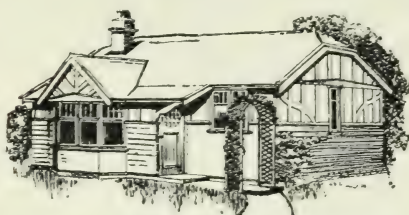
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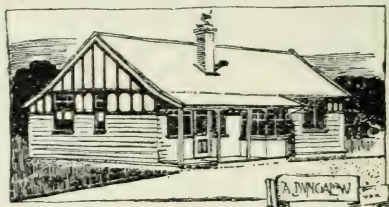
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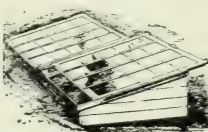


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For preventing and destroying **Red Spider, Green Fly, &c.** Harmless in use. Its soluble sulphur, &c., has for 40 years cured **blights** and **fungus** on plants. It is also useful for washing unhealthy dogs.

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Specially prepared as an **insecticide**, including

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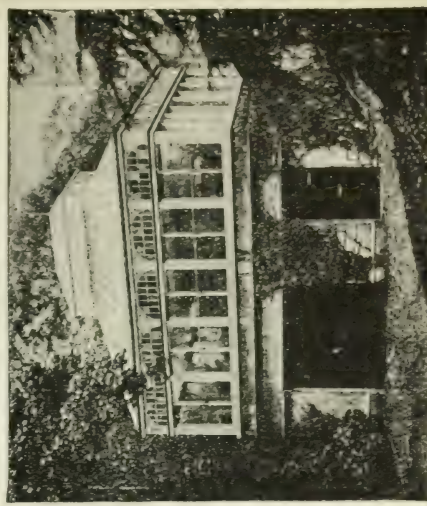
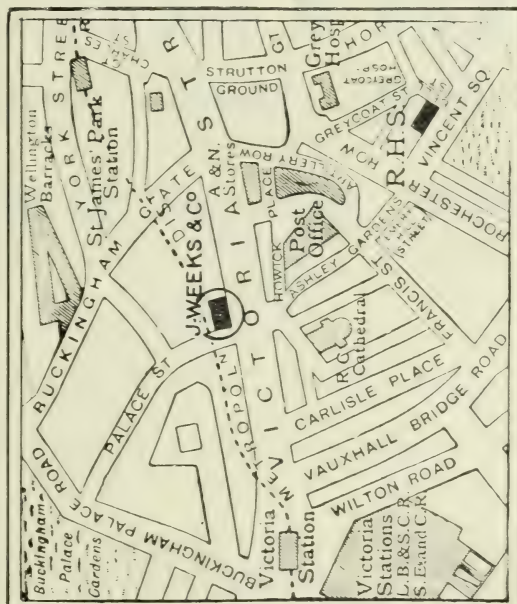
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**IT IS  
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*Will supply Pamphlets, gratis, upon application.*



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Vincent Square, Westminster, S.W.

## Privileges of Fellows.

- 1.—Anyone interested in Horticulture is eligible for election, and is invited to become a Fellow.
- 2.—Candidates for election are proposed by two Fellows of the Society.
- 3.—Ladies are eligible for election as Fellows of the Society.
- 4.—The Society being incorporated by Royal Charter, the Fellows incur no personal liability whatsoever beyond the payment of their annual subscriptions.
- 5.—Forms for proposing new Fellows may be obtained from the Offices of the Society, Vincent Square, Westminster, S.W.
- 6.—If desired, the Secretary will, on receipt of a letter from a Fellow of the Society suggesting the name and address of any lady or gentleman likely to become Fellows, write and invite them to join the Society.

### FELLOWS.

**A Fellow subscribing Four Guineas a year (or commuting for Forty Guineas) is entitled—**

- 1.—To ONE Non-transferable (personal) Pass and FIVE Transferable Tickets admitting to all the Society's Exhibitions, and to the Gardens.
- 2.—To attend and vote at all Meetings of the Society.
- 3.—To the use of the Libraries at the Society's Rooms.
- 4.—To a copy of the Society's JOURNAL, containing the Papers read at all Meetings and Conferences, Reports of trials made at the Gardens, and descriptions and illustrations of new or rare plants, &c.
- 5.—To purchase, at reduced rates, such fruit, vegetables, and cut flowers as are not required for experimental purposes.
- 6.—To a share (in proportion to the annual subscription) of such surplus or waste plants as may be available for distribution. Fellows residing beyond a radius of 35 miles from London (by the A B C Railway Guide) are entitled to a double share.
- 7.—Subject to certain limitations, to obtain Analysis of Manures, Soils, &c., or advice on such subjects, by letter from the Society's Consulting Chemist, Dr. J. A. Voelcker, M.A., F.I.C.
- 8.—To have their Gardens inspected by the Society's Officer at the following fees:—One day, £3. 3s.; two days, £5. 5s.; *plus* all out-of-pocket expenses.
- 9.—To exhibit at all Shows and Meetings, and to send seeds, plants, &c., for trial at the Society's Gardens.
- 10.—To recommend any ladies or gentlemen for election as Fellows of the Society.

**A Fellow subscribing Two Guineas a year (or commuting for Twenty-five Guineas) is entitled—**

- 1.—To ONE Non-transferable Pass and Two Transferable Tickets.
- 2.—To the same privileges as mentioned in Nos. 2, 3, 4, 5, 6, 7, 8, 9, 10, as above.

**A Fellow subscribing One Guinea a year, with an Entrance Fee of £1. 1s. (or commuting for Fifteen Guineas), is entitled—**

- 1.—To ONE Transferable Ticket (in lieu of the non-transferable personal Pass), and the privileges mentioned in Nos. 2, 3, 4, 5, 6, 7, 8, 9, 10, as above.

[*Bonâ fide* Gardeners earning their living thereby, and persons living permanently abroad, are exempt from the payment of the Entrance Fee.]

*N.B.*—Each Transferable Ticket or Non-transferable personal Pass will admit three persons to the Gardens at Wisley on any day *except* days on which an Exhibition or Meeting is being held, when each Ticket or Pass will admit One Person only. The Gardens are closed on Sundays, Good Friday, and Christmas Day.

### ASSOCIATES.

**An Associate subscribing 10s. 6d. a year is entitled—**

- 1.—To ONE Non-transferable Pass, and to privileges as mentioned in Nos. 3, 4, and 9.

*N.B.*—Associates must be *bonâ fide* Gardeners, or employés in a Nursery, Private or Market Garden, or Seed Establishment, and must be recommended for election by Two Fellows of the Society.

*A form of Recommendation for a Fellow of the Royal Horticultural Society, which can be easily detached for use, will be found on advertisement page 32.*

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Incorporated  
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## Form of Recommendation for a FELLOW of the ROYAL HORTICULTURAL SOCIETY.

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Name .....

Description .....

Address .....

being desirous of becoming a FELLOW of the ROYAL HORTICULTURAL SOCIETY, we whose Names are underwritten beg leave to recommend him (her) to that honour ; he (she) is desirous of subscribing \*  
Guineas a year.

Proposed by .....

Seconded by .....

\* Kindly enter here the word *four* or *two* or *one*.

It would be a convenience if the Candidate's Card were sent at the same time.

Signed on behalf of the Council, this ..... day of ..... 190 .....

..... CHAIRMAN.

For Privileges of Fellows see advertisement, page 30.





# CORRY'S concentrated WINTER DRESSING for FRUIT and other TREES.

For the destruction of all Insect Germ and Pests that shelter in the Bark during the Winter Months.

This preparation has been most successfully tested under special supervision by practical Growers and is highly recommended by all Fruit Growers.

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It is by far the cheapest Insecticide known. One pint makes ten to twelve gallons for Thrip, Black and Green Fly, &c., whilst RED SPIDER, Mealy Bug, and Scale can be thoroughly eradicated by using “NIQUAS” double or three times the strength required for Fly.

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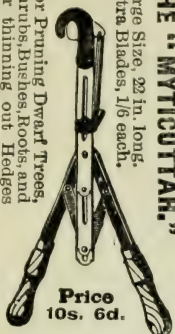
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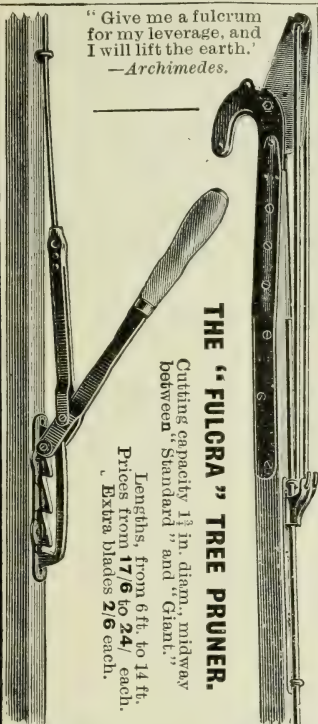
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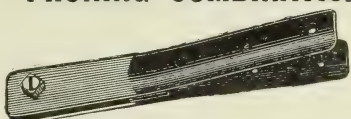
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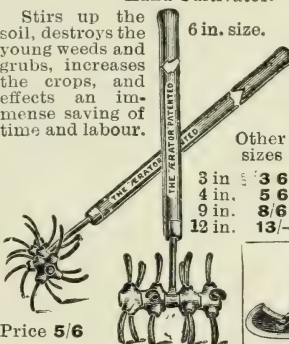
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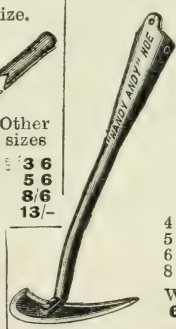
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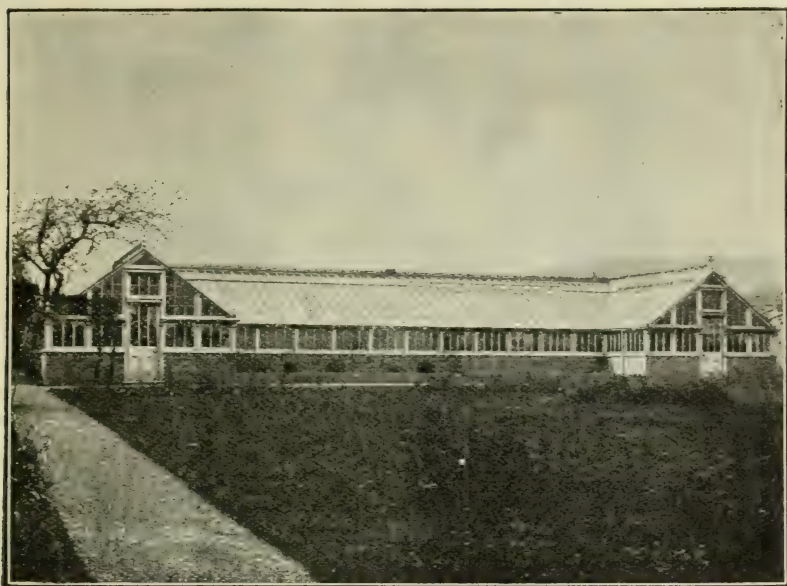
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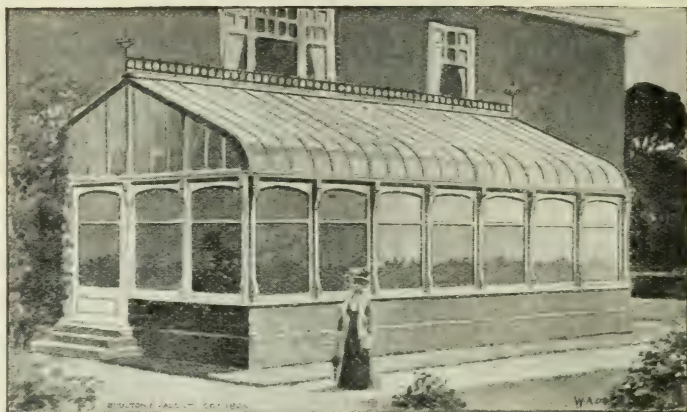
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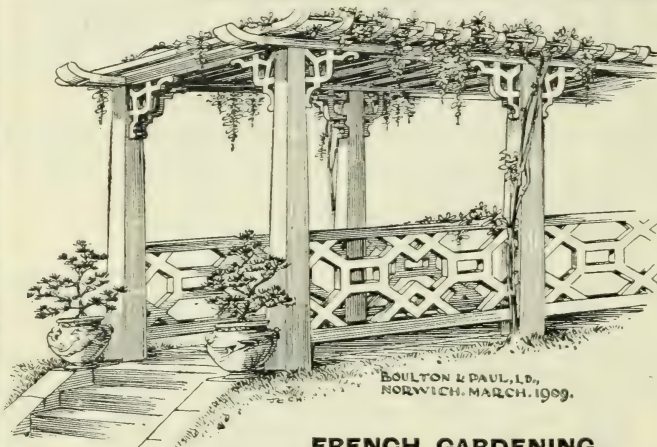


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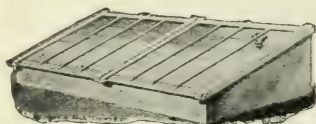
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### Fungoid Pests of Cultivated Plants.

The attention of Fellows is directed to a handsome volume recently published by the Society on Fungoid Pests of Cultivated Plants, by Dr. M. C. Cooke, V.M.H. It consists of 280 pages of letterpress, and is illustrated with 24 coloured plates, containing figures of 360 different fungoid attacks, and 23 woodcuts. Each pest is described separately, and means for its prevention or eradication are given, and the whole work is written so as to interest and instruct the cultivator in the simplest and most practical manner. The volume is bound in buckram, and makes an admirable school prize or gift to a gardener or student of nature.

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|--------------|---------------------------------------------------------------|---------------|---------------|--------------|----------------------------------------------|---------------|---------------|
| Jan.         | Fulgens Oculata Gigantea                                      | April         | Sept.         | May          | Fulgens var., F. Oc. Gig. &c. In open ground | April to June | Nov. to Feb.  |
|              | " " seedlings } In cold frames or under glass.                | April         | Sept.         |              | Coronaria var., King of                      | "             | Nov. to Feb.  |
|              | Blanda var. } under glass.                                    | April         | Sept.         |              | Neurosa fl. pl.                              | "             | Sept. to Nov. |
|              | Hepatica Triloba } In sheltered quarters                      | April         | Feb. March    |              | Sylvestris Robinsoniana                      | "             | Sept. to Nov. |
| Feb.         | Fulgens Oculata Gigantea and } In cold frames or under glass. | April         | Sept.         | June         | Narcissiflora                                | "             | Feb. March    |
|              | Coronaria seedlings } under glass.                            | April         | Sept.         |              | Late planting of Coronaria & Fulgens In open |               | March         |
|              | Fulgens var. } In open ground                                 | April         | Feb. March    |              | Balkensis                                    | "             | Sept. to Dec. |
|              | Hepatica Triloba } In open ground                             | April         | Oct. Nov.     |              | Dichotoma (Pennsylvanica)                    | "             | Feb. March    |
| March        | Fulgens Oculata Gigantea and } Under glass if a mild Spring   | April         | Sept.         | July         | Very late planting of Coronaria              |               | May           |
|              | Coronaria seedlings } and in open                             | April         | Sept.         |              | Balkensis                                    | In shade      | April         |
|              | Fulgens var. } mild Spring                                    | April         | Feb. March    |              | Dichotoma (Pennsylvanica)                    | In open       | Feb. March    |
|              | Hepatica Triloba & Angulosa In open ground                    | April         | Oct. Nov.     |              | Japonica                                     | In open       | Feb. to April |
| April        | Pulsatilla                                                    | April         | Sept. to Nov. | Aug.         | Japonica                                     | In open       | Feb. to April |
|              | Blanda var.                                                   | April         | Sept. to Nov. | Sept.        | Coronaria seedlings or unlifted tubers       | "             | Feb. to April |
|              | Nemorosa                                                      | April         | Sept. to Nov. |              | Japonica                                     | In open       | Feb. to April |
|              | Fulgens var. F. Oc. Gig. &c. In open ground                   | April to June | Sept. to Nov. | Oct.         | Coronaria seedlings or unlifted tubers       | "             | Feb. to April |
|              | Coronaria var., King of                                       | "             | Sept. to Nov. |              | Fulgens and Coronaria var.                   | Under glass   | August        |
|              | Appennina var.                                                | "             | Sept. to Nov. | Nov.         | Coronaria seedlings Under glass or in open   | "             | "             |
|              | Ranunculoides                                                 | "             | Sept. to Nov. |              | Fulgens and Coronaria var.                   | Under glass   | "             |
|              | Nemorosa & fl. pl.                                            | "             | Sept. to Nov. | Dec.         | Fulgens Oculata Gigantea                     | "             | Aug. Sept.    |
|              | Sylvestris Robinsoniana                                       | "             | Feb. March    |              | Fulgens seedlings                            | "             | April         |
|              | Narcissiflora                                                 | "             | Sept. to Nov. |              | Coronaria seedlings                          | "             | April, May    |
|              | Trifolia                                                      | "             | Sept. to Nov. |              |                                              |               |               |

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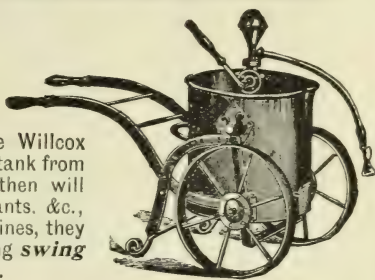
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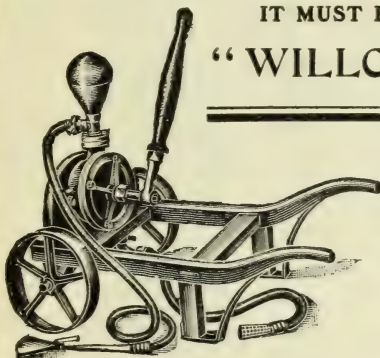
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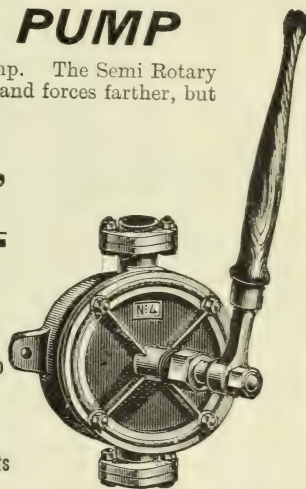
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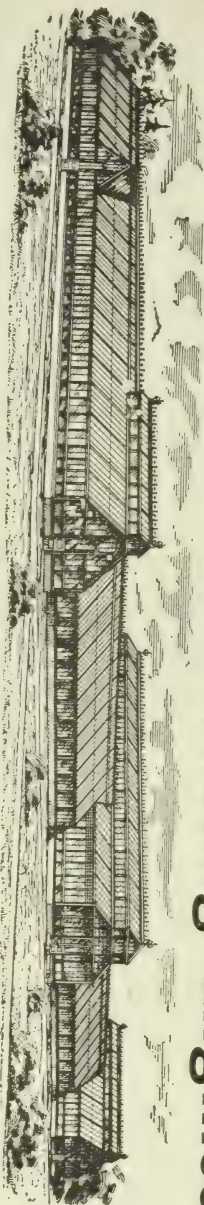
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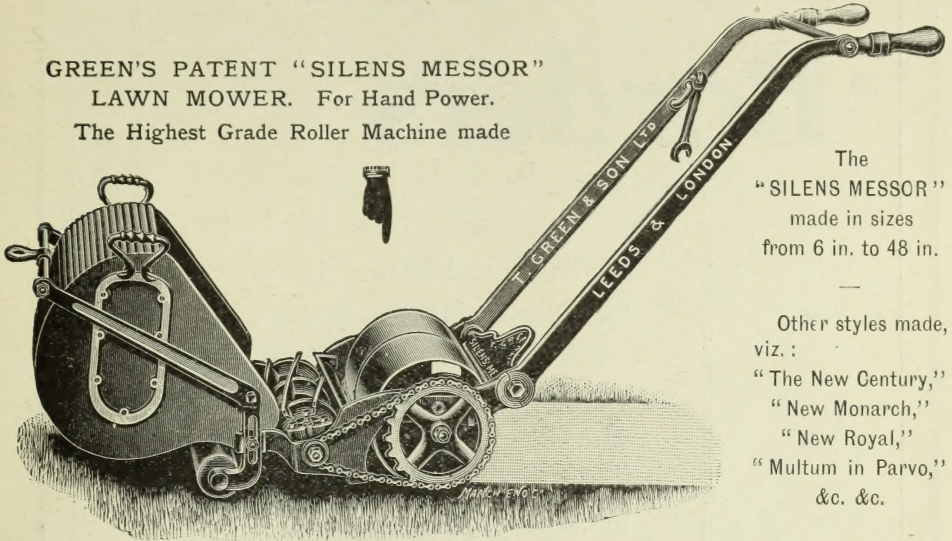
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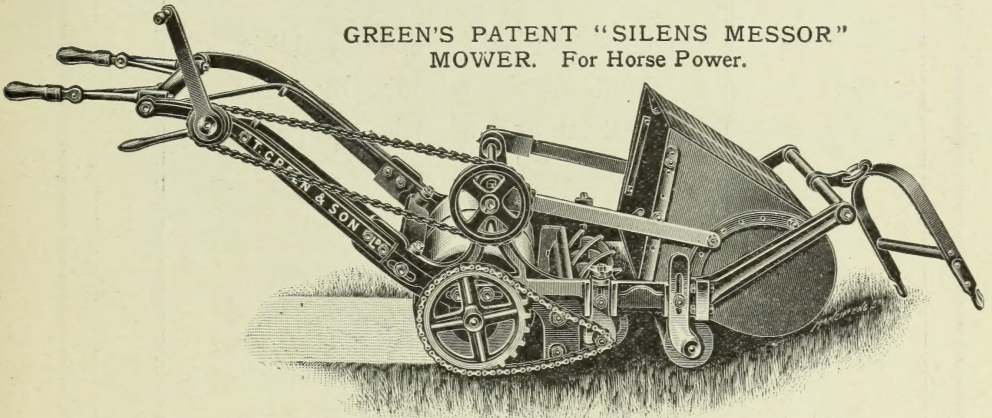
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